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ABSTRACT

This Job Function Booklet (Building and Making) is one of the 14 components (see note) of the Career Alert Planning (CAP) program, a set of individualized materials designed to help participants find out about themselves and about the kind of work for which they are suited. In this program, participants become acquainted with occupations that are representative of 10 basic job functions. They learn how these occupations relate to personal interests, abilities, skills, educational goals, experiences, and training. They consider the working conditions, salary, and employment outlook for each occupation. Finally, participants use this information to make decisions and plans about the careers they will pursue. This Job Function Booklet examines building and making occupations, one of the 10 basic job functions explored in the series, and describes four occupations related to this function: carpenter, painter, roofer, and drafter. The booklet contains the following sections: (1) an "explore" section, which describes the building and making job function and introduces the four occupations representative of it; (2) four "perform" sections, which contain work simulation activities related to each of the four occupations (e.g., "imagine you are a carpenter; your task is to help estimate some of the materials needed to build a new room addition on a house"); these activities give participants "hands-on" experience in performing work-related tasks; and (3) four "decide" sections, which provide greater detail about the occupations and about working conditions, income, and education and experience required. Education and experience activities that can be undertaken by participants are suggested. (KC)

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CAP

Building and Making

Job Function

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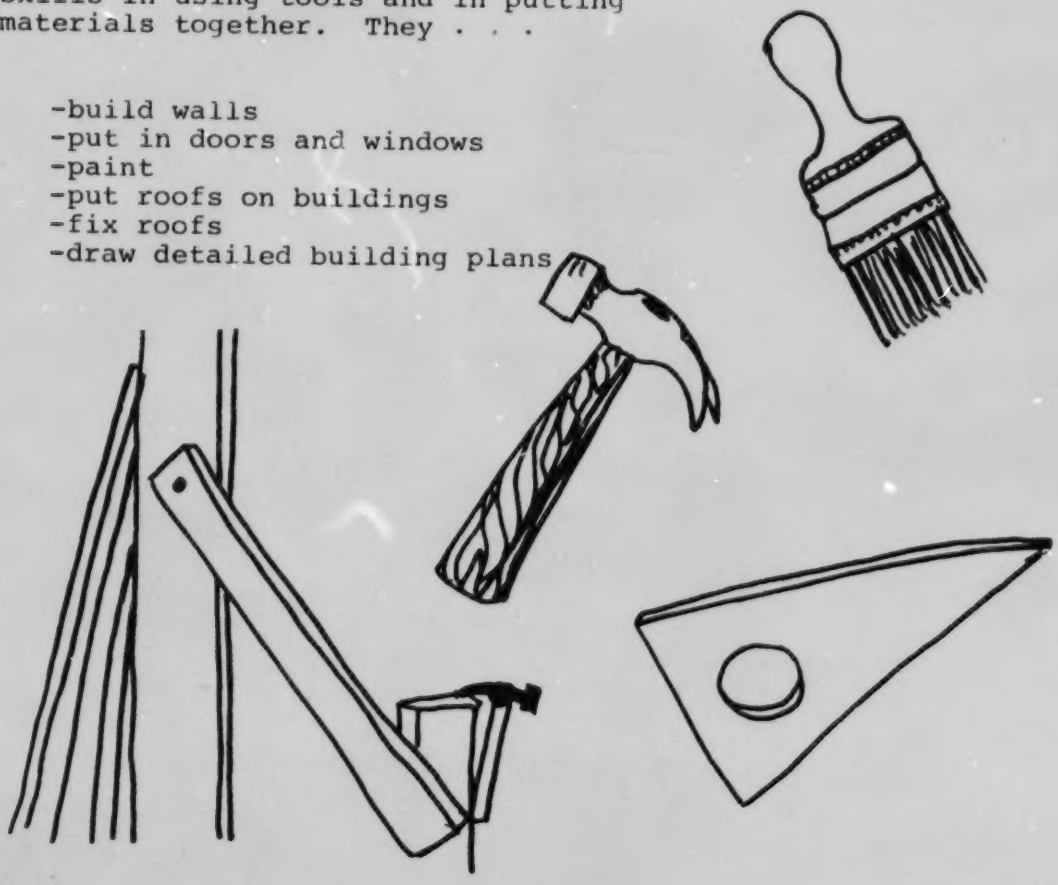
What is building and making?

EXPLORE

Building and making involve working with your hands. Building and making mean putting things together to make new things. If you make models, candles, or clothing, you know about building and making.

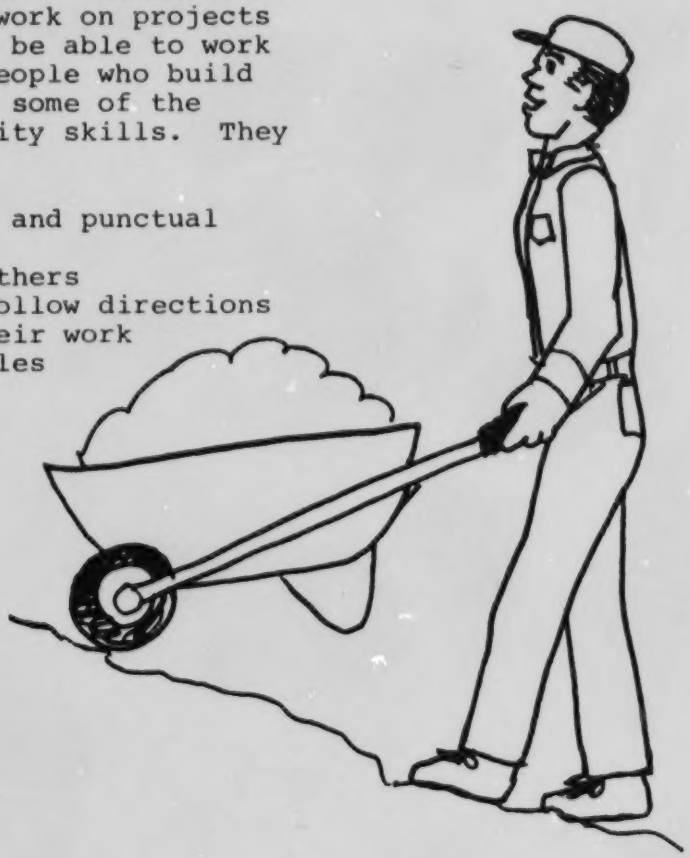
People in building and making jobs need skills in using tools and in putting materials together. They . . .

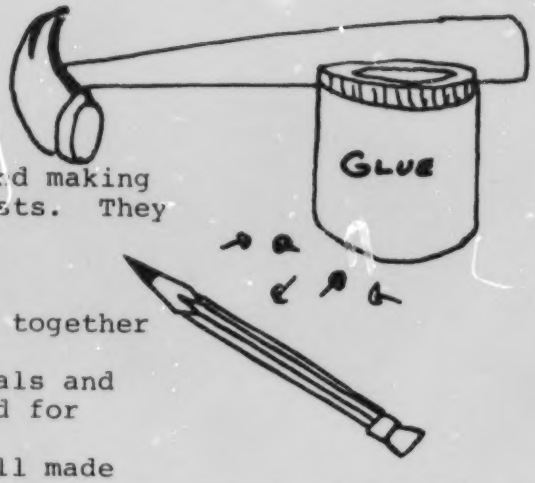
- -build walls
- -put in doors and windows
- -paint
- -put roofs on buildings
- -fix roofs
- -draw detailed building plans



People who work in building and making jobs usually work by themselves but alongside other workers. Sometimes they form teams and work on projects together. They must be able to work well with others. People who build and make things need some of the following work maturity skills. They must . . .

- -maintain regular and punctual attendance
- -cooperate with others
- -understand and follow directions
- -take pride in their work
- -follow safety rules

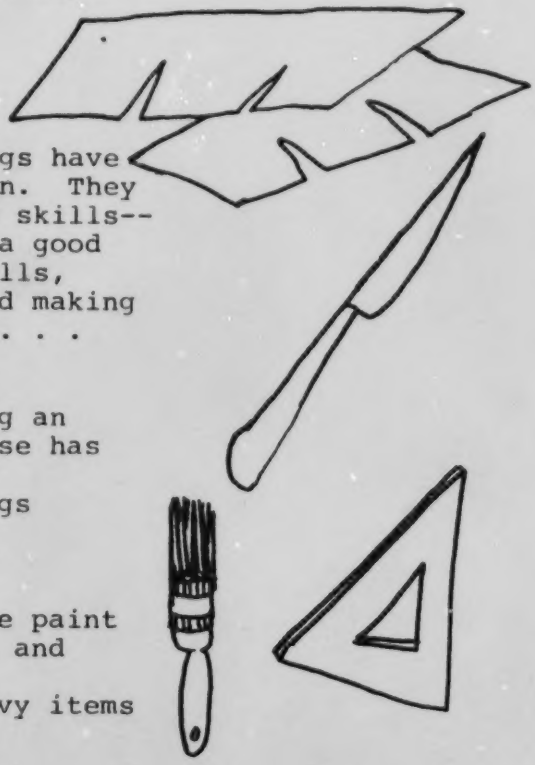




Interests

People who work in building and making jobs share many common interests. They enjoy . . .

- -working with tools
- -helping people put things together
- -painting
- -studying different materials and learning what each is used for
- -working outdoors
- -seeing things that are well made



Abilities

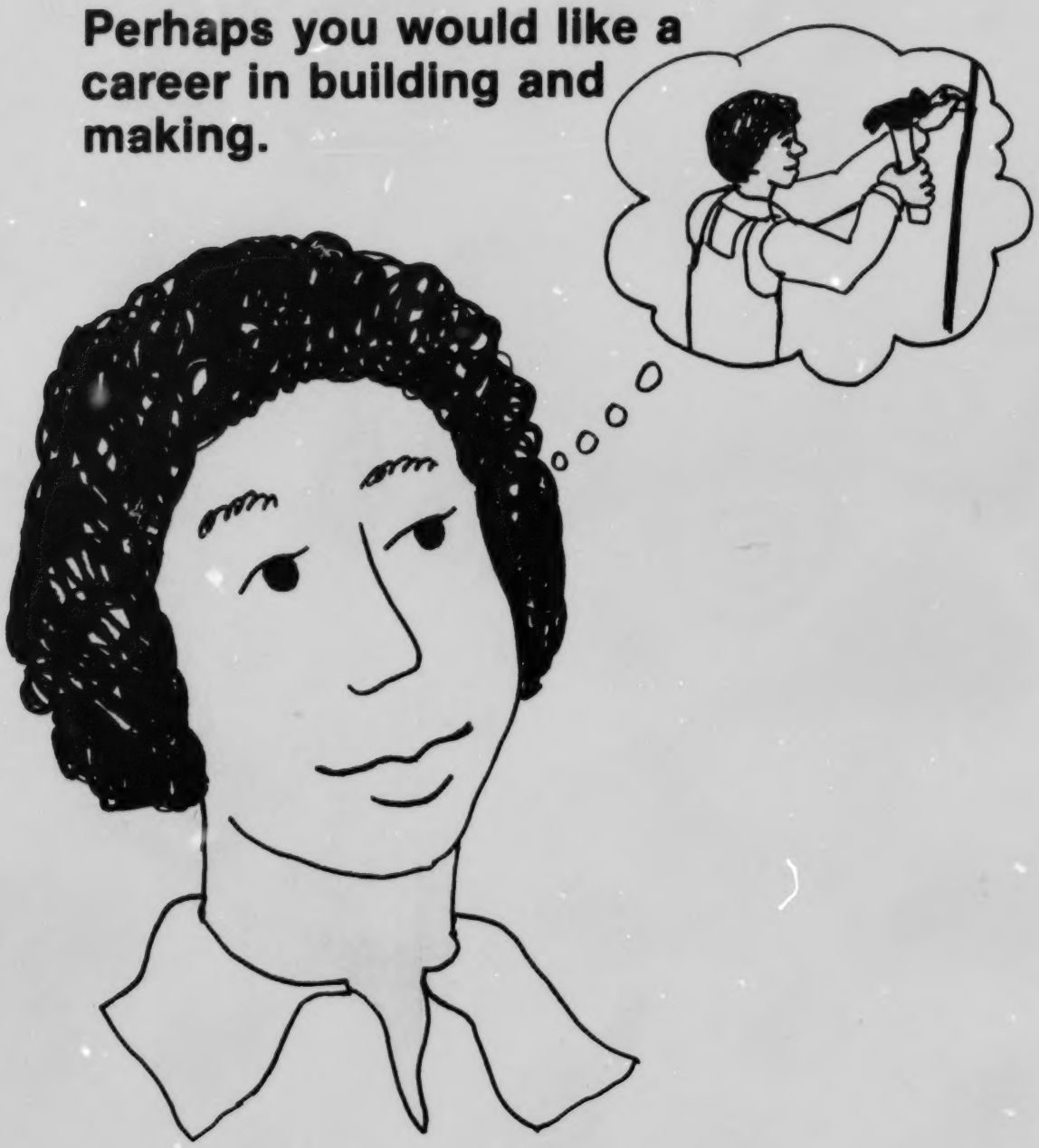
People who build and make things have a number of abilities in common. They use their abilities to develop skills--skills that enable them to do a good job. To develop their job skills, people who work in building and making jobs must have the ability to . . .

- -make something by following an example of what someone else has made
- -figure out how to put things together
- -choose the right tools for a project
- -match colors of things like paint
- -measure the length, width, and depth of things
- -climb ladders and lift heavy items

Do you feel you have some of the interests and abilities of people who build and make things? Turn to the Building and Making Reaction Form in your Program Guide. Place a check in front of the interests and abilities you share with people who work in building and making jobs.

Now you will meet people in several building and making occupations. Read about these people. Imagine yourself in their jobs, because . . .

Perhaps you would like a career in building and making.



Donna Murray
carpenter

I build and make the inside parts of houses. I plan the work and buy materials to do it. I build walls and put windows and doors in the walls. I know how to use different kinds of wood, nails, and other building materials. I measure accurately so everything fits together well.

Carpentry can be hard work, but I enjoy working with my hands. I like to see that things are well built.

Jimmy Wolinski
painter

I know a lot about paints and painting tools. I have to know which paints are best for different surfaces. (Walls and ceilings are some of the surfaces I paint.) I have to decide how much paint is needed.

Also, I have to figure out the best way to apply the paint to the surface. For some jobs I use a large brush. For other jobs I might use a sprayer or a roller. I like to make things look new!

Lou Cusella
roofer

People call me to fix their roof or build a new one. I plan the job and buy materials to do it.

I put shingles, tar paper, or other materials on the roof. Roofing is hard work. I have to lift heavy materials. But I like exercise and I'm always on top of things!

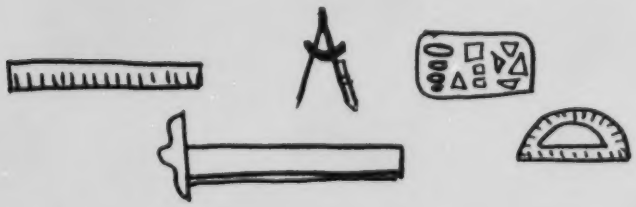
Sue Arrowsmith
drafter

I work for an architect (a person who designs buildings). The architect gives me rough sketches of building plans. I make finished drawings from these sketches. To do this, I use many kinds of drafting (drawing) tools.

I use..

-a straight edge,
-a T-square,
-a compass,
-a protractor, and
-templates.

I must pay a lot of attention to detail. Each part of the drawing must be just right. These tools help me to make accurate drawings.

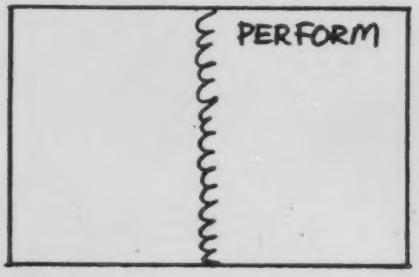


Would you like to try out some jobs that these workers do?

yes ▶ Choose one of these occupations:

Occupation 9--Carpenter
Occupation 10--Painter
Occupation 11--Roofer
Occupation 12--Drafter

Then, turn to the proper PERFORM section of this Job Function booklet.



no ▶ Check your Self-Inventory Chart. Choose your next highest-ranking job function. Get that Job Function booklet and read the EXPLORE section.

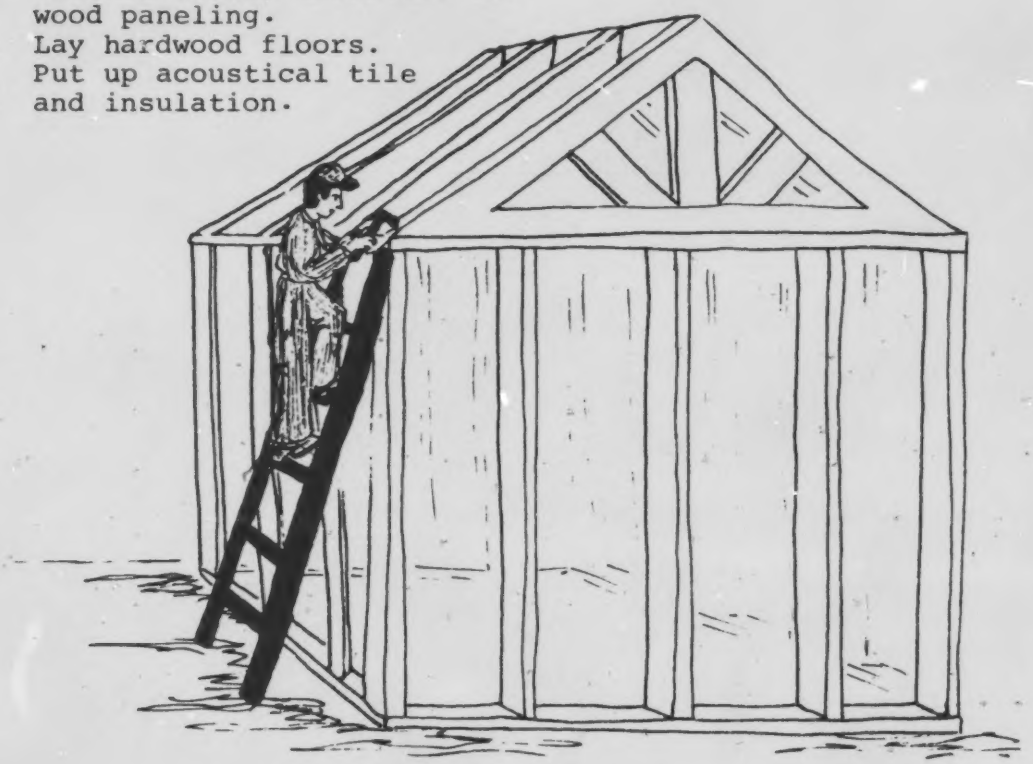
Carpenter

PERFORM 9

Carpenters work for building contractors. (Contractors are in charge of building projects like houses, office buildings, bridges, and so forth.) Carpenters build the wood parts of a project. They have many responsibilities.

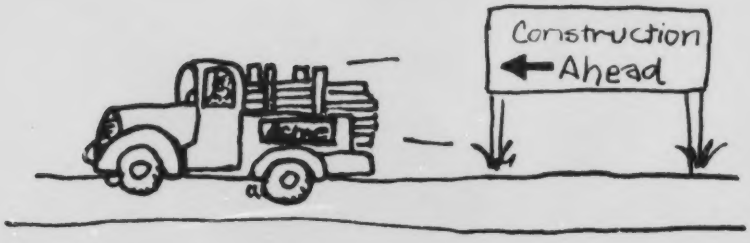
Responsibilities

1. Build house frameworks, stairs, scaffolds, and wooden frames for concrete.
2. Build bridges, docks, and supports for tunnels and sewers.
3. Install doors, cabinets, and wood paneling.
4. Lay hardwood floors.
5. Put up acoustical tile and insulation.

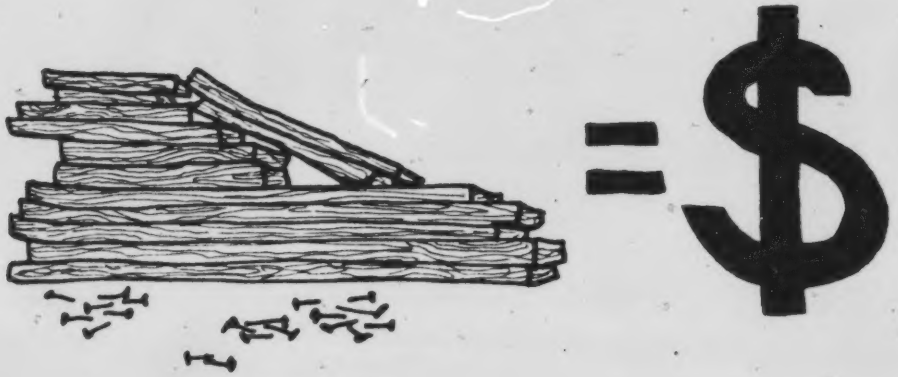


You will learn one part of building house frameworks as you PERFORM the following activity.

Imagine . . . YOU are a carpenter.



You work for the Acme Construction Company. Before the company is hired to do a job, they need to find out how much material they'll need. Then they can give the customer a cost estimate (a good idea of the cost).



The Jackson family wants to add a new family room to their house. You must find out how many wall studs, paneling sheets, and nails will be needed for this job.

Your task is to help estimate some of the materials needed to build the new room.

This is what you must do:

Identify building materials you will need

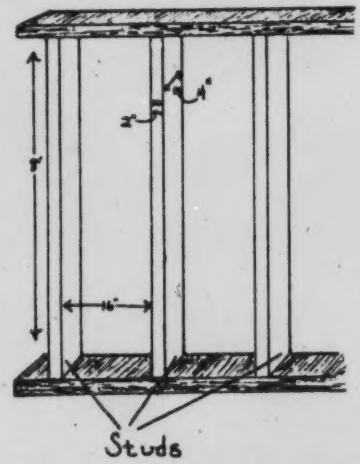
STEP 1.

Read the information that follows.

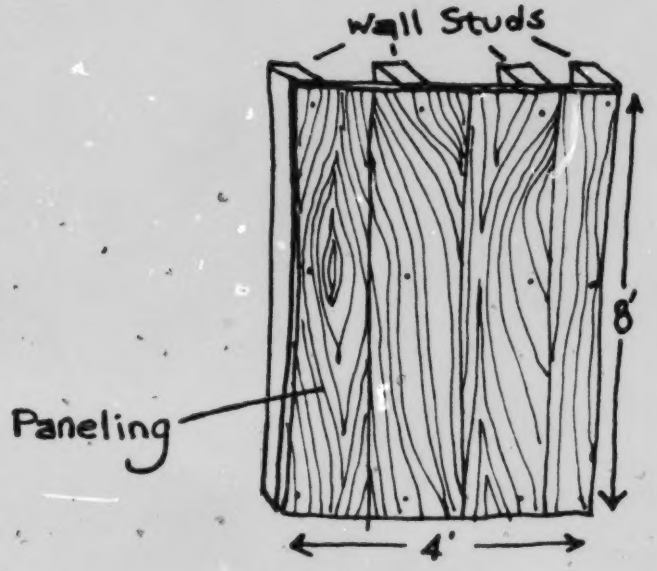
Building Materials

WALL STUDS are boards that go from the floor to the ceiling. They are 8 feet long and are made from boards called 2 x 4s. The name 2 x 4s is used because they are almost 4 inches wide and almost 2 inches thick.

Wall studs are placed 16 inches apart around a room. Paneling is nailed to the studs to form walls.



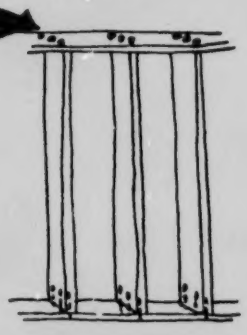
PANELING is made of wood or other material. A panel is thin and flat. Wood panels are nailed to wall studs. Paneled walls look like wood walls. Panels are 4 feet wide and 8 feet tall.

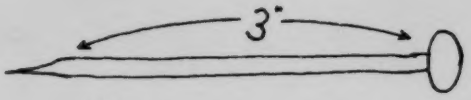


NAILS are used for many purposes. You will use two kinds of nails to build the room: common nails and finishing nails.

Common nails have big flat heads. You will use common nails to put the wall studs in the wall.

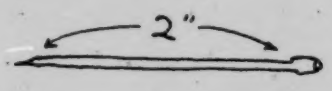
Common nails are made in different sizes. You will use common nails that are 3 inches long. You will need 6 common nails to put up each stud.



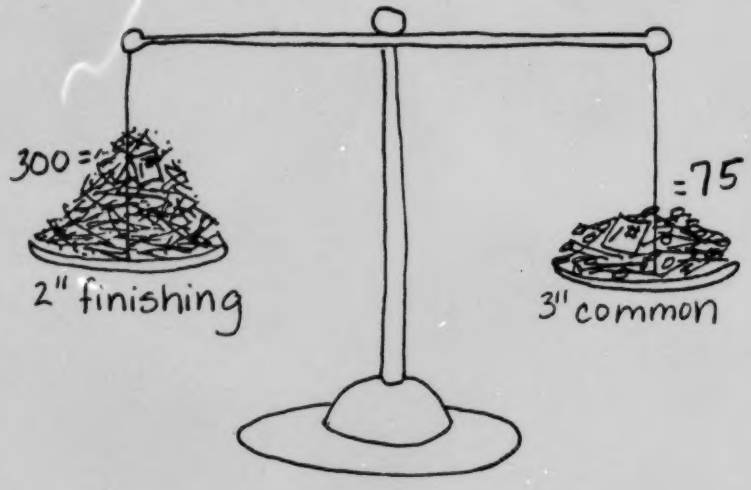


Finishing nails have small heads. The heads are small so people won't see them when they look at a wall. You will use finishing nails to put the paneling on the wall studs.

Finishing nails are made in different sizes. You will use finishing nails that are 2 inches long. You will need 20 finishing nails to put up each sheet of paneling.



Nails are sold by the pound. There are about 75 3-inch common nails per pound and about 300 2-inch finishing nails per pound.

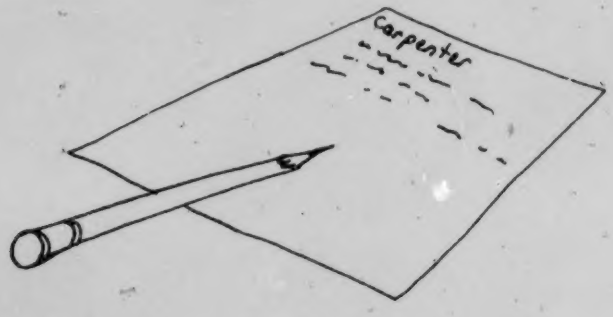


STEP 2.

Identify the picture of each building material.

a. Turn to Worksheet 9a, Carpenter.

b. Follow the instructions on the worksheet.



State how each building material is used

STEP 1.

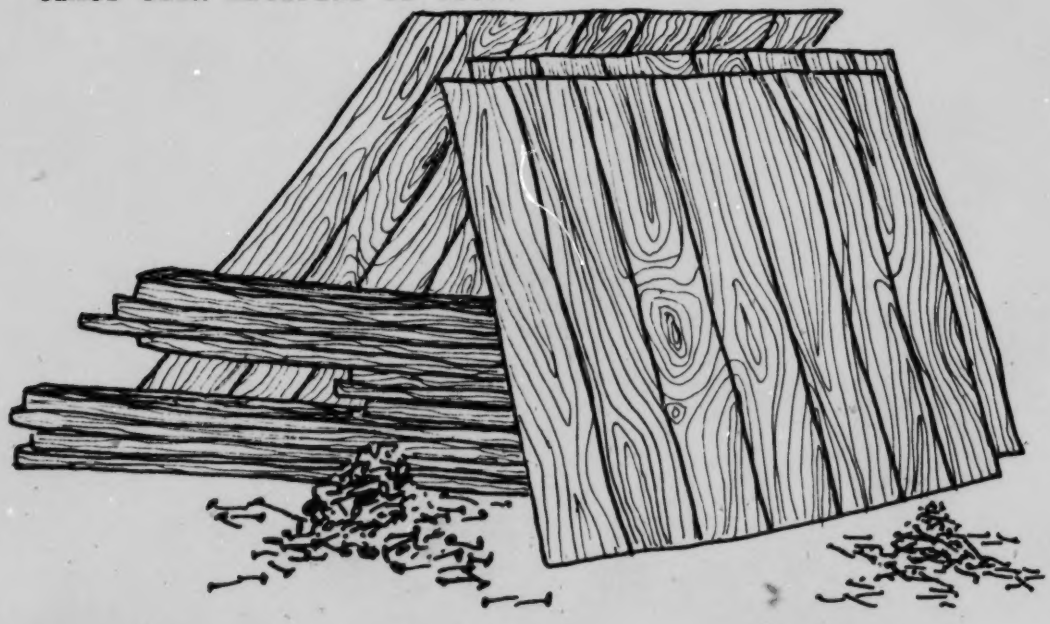
Re-read the information on pages 13-16.

STEP 2.

Find the length and/or width of each material.

STEP 3.

Find out how far apart or how many times each material is used.



STEP 4.

Record the information by completing Worksheet 9b, Carpenter.

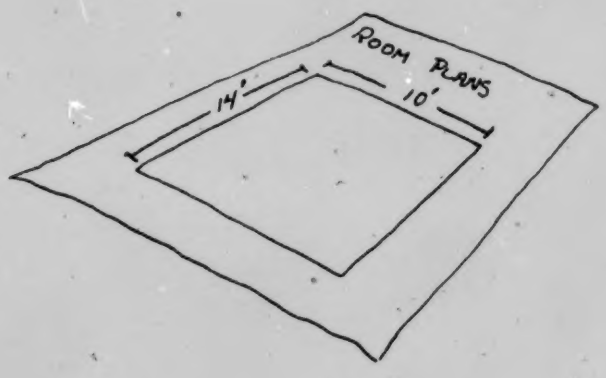
Find out the size of room that is to be built

STEP 1.

Read the information below.

The Room

The room is 14 feet long and 10 feet wide. The walls are 8 feet high. You will put wall studs and panels on every wall.



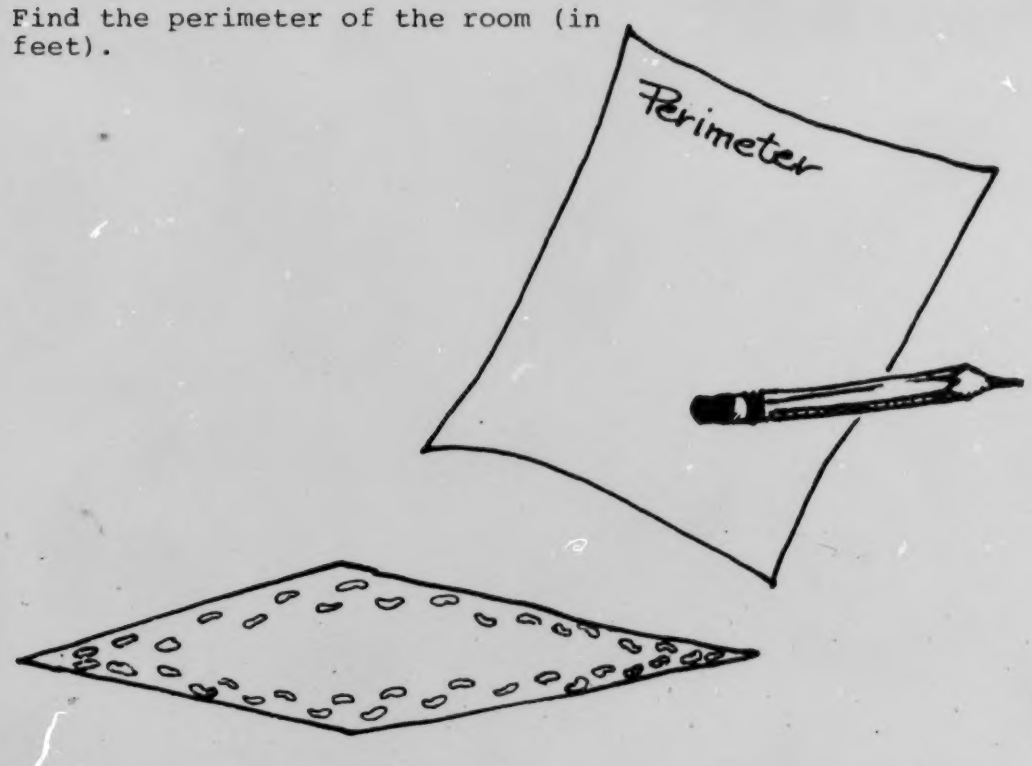
STEP 2.

Write the room dimensions on Worksheet 9d, Carpenter. (Skip 9c; you will do that worksheet later.)

List the number of wall studs you will need

STEP 1.

Find the perimeter of the room (in feet).

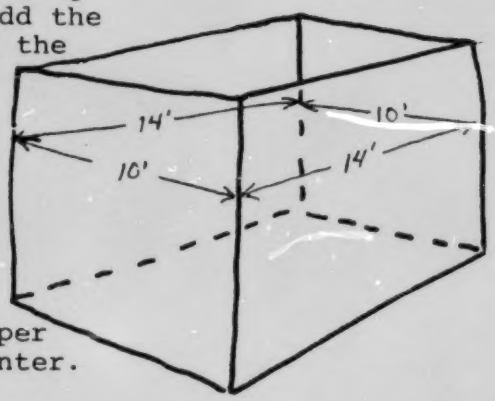


The perimeter is the distance around the room. How far would you walk if you started at one corner of a room and walked all the way around the walls and back to your starting corner? You would have walked the <u>perimeter</u> of the room.

a. Do Worksheet 9c, Carpenter. It will give you practice in adding up the length of 4 sides of a room.

b. Add the measurements of each side of the room you will build.

For the family room there are four walls; two walls are 14 feet long and two are 10 feet long. Add the measurements of each edge of the room.



c. Write this number in the proper place on Worksheet 9d, Carpenter.

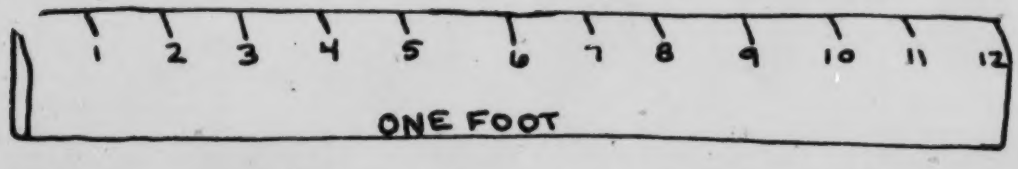
STEP 2.

Find the number of inches in the perimeter.

a. Multiply the number of feet in the perimeter (your answer) by 12.

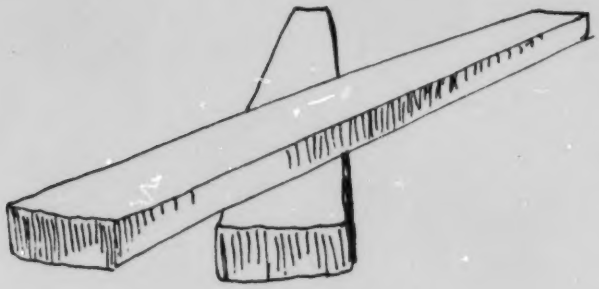
There are 12 inches in one foot. So, you must multiply the number of feet by 12 to get the number of inches.

b. Write your answer on Worksheet 9d. It is the number of inches in the perimeter of the family room.



STEP 3.

Figure out how many wall studs you will need for this room.



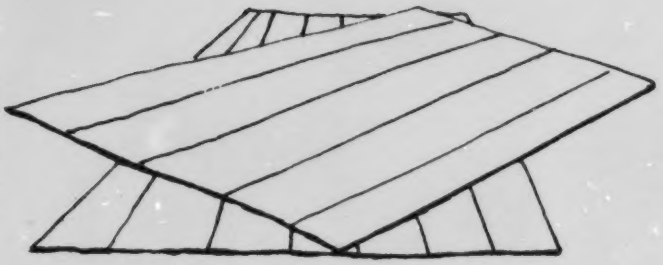
studs
16 ⟌ perimeter

a. Recall how far apart wall studs are placed. Read the information on page 13 if you have forgotten.

b. Divide the perimeter (in inches) by 16.

c. Write the number of wall studs you will need on Worksheet 9d, Carpenter.

List the number of panels you will need



STEP 1.

Recall the width of a panel. Read the information on page 14 if you have forgotten how wide a panel is.

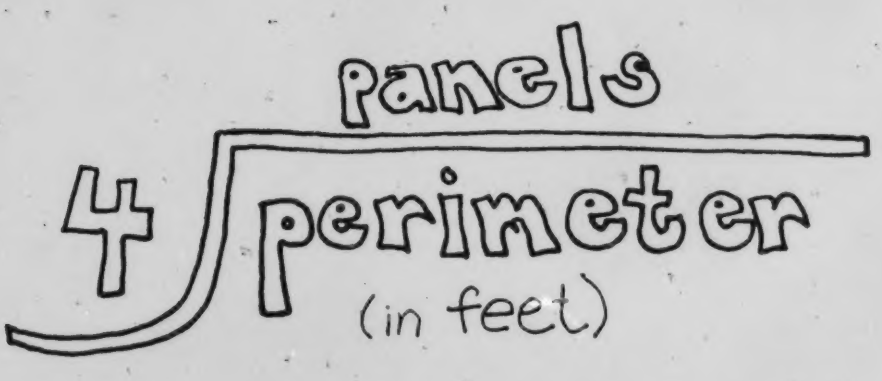
STEP 2.

Divide the perimeter (in feet) by 4.

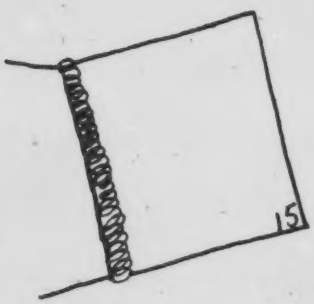
Each piece of paneling is 4 feet wide. You need to find how many 4-foot widths are in the perimeter. This will tell you the number of panels you need.

STEP 3.

Write the number of panels you will need on Worksheet 9d, Carpenter.



List the pounds of common nails you will need



STEP 1.

Recall the size of common nails and the numbers of nails you need to put up each wall stud. Read the information on page 15 if you have forgotten.

STEP 2.

Multiply the number of studs by 6.

You need 6 nails to put up each wall stud. So you need 6 nails for 1 stud, 6 x 2 nails for 2 studs, etc.

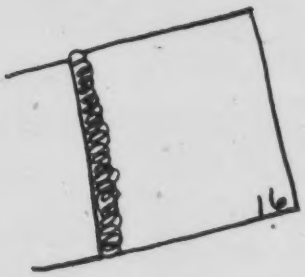
studs
x 6
common nails

STEP 3.

Write the number of nails you will need on Worksheet 9d, Carpenter.

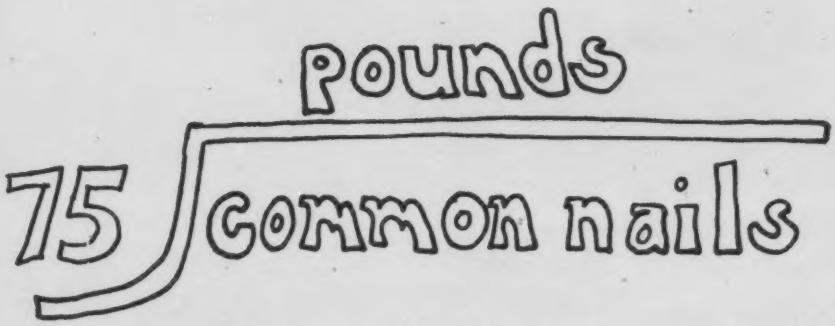
STEP 4.

Recall how many common nails are in a pound. Read the information on page 16 if you have forgotten.



STEP 5.

Divide the number of nails by 75. Do this because there are 75 nails in each pound.



STEP 6.

Write the number of pounds of common nails you will need on Worksheet 9d, Carpenter.

List the pounds of finishing nails you will need

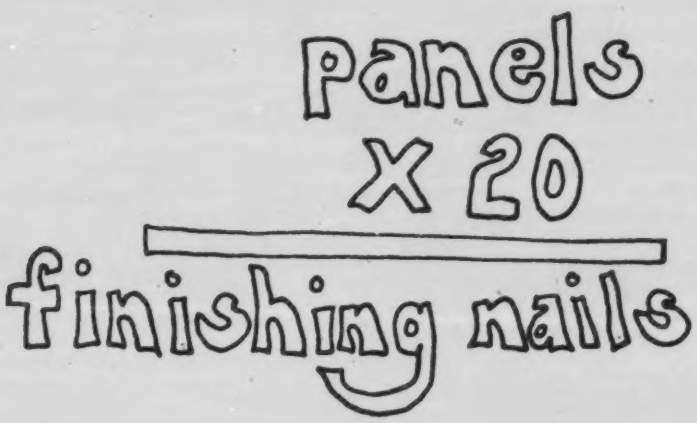
STEP 1.

Recall the size of finishing nails and the number of nails you need to put up each panel. Read the information on page 15 if you have forgotten.

STEP 2.

Multiply the number of panels by 20.

You need 20 nails for each panel. So you need 20 nails for 1 panel, 20 x 2 nails for 2 panels, and so forth.



STEP 3.

Write the number of finishing nails you will need on Worksheet 9d, Carpenter.

STEP 4.

Recall how many finishing nails are in a pound. Read the information on page 16 if you have forgotten.

STEP 5.

Divide the number of finishing nails by 300. Do this because there are 300 finishing nails in a pound.

pounds
300) finishing nails

STEP 6.

Write the number of pounds of finishing nails you will need on Worksheet 9d, Carpenter.

Check your work to make sure it is correct

STEP 1.

Look at the answers in the key at the bottom of this page. Did you get them all right?

STEP 2.

If so, continue reading.

STEP 3.

If not, work on the problems until you get the right answers.

Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Find the Carpenter page. Record your feelings about your interests and abilities in this activity. Then turn to the next page.

Key:

perimeter: 576 inches
number of wall studs: 36
number of panels: 12
pounds of common nails: 3
pounds of finishing nails: 1

Did you like being a carpenter? Yes?
Then here are

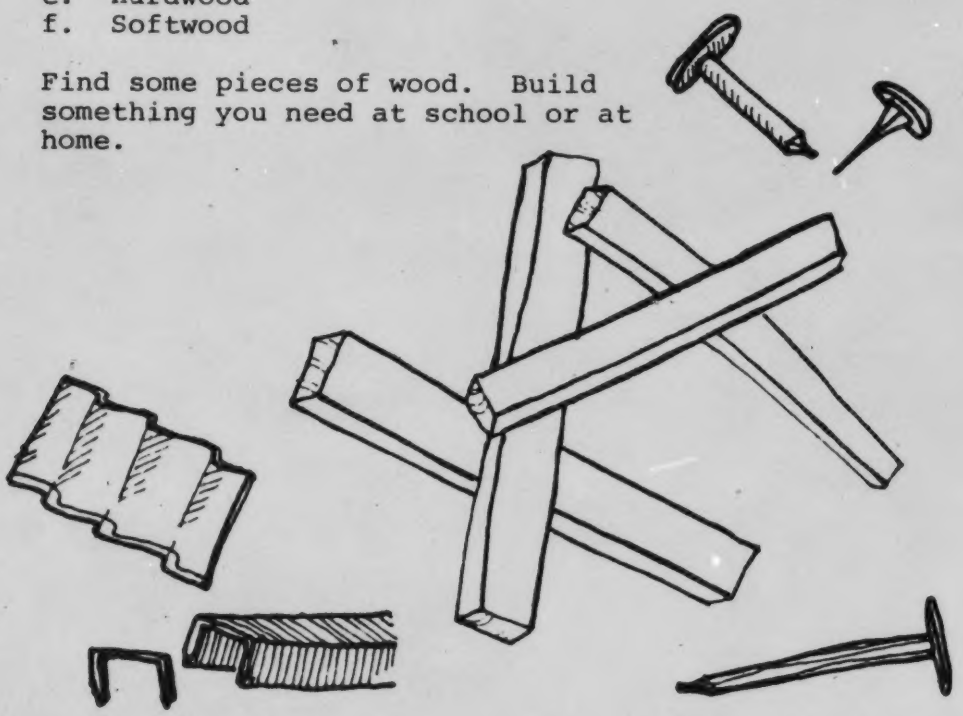
Some other activities:

1. Ask a contractor if you could visit a building site. Watch the carpenter putting in the studs and the paneling.

2. Look up "nails" and "lumber" in an encyclopedia or a book on carpentry. Find out what these building materials are used for:

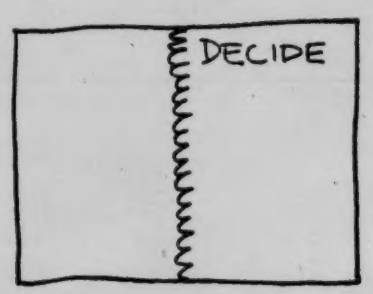
   a. Cement nails
   b. Carpet tacks
   c. Roofing nails
   d. Staples
   e. Hardwood
   f. Softwood

3. Find some pieces of wood. Build something you need at school or at home.



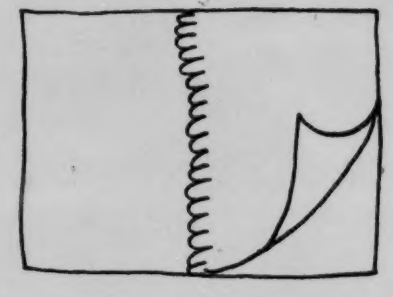
Would you like to find out more about this occupation?

yes ▶ Read DECIDE 9--Carpenter.

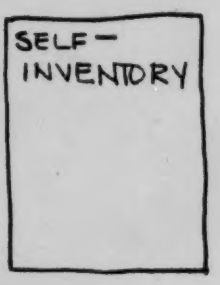


no ▶ Turn to another Building and Making occupation:

Occupation 10--Painter
Occupation 11--Roofer
Occupation 12--Drafter



or ▶ Look at the Self-Inventory Chart in your CAP Program Guide. Select another job function to investigate.

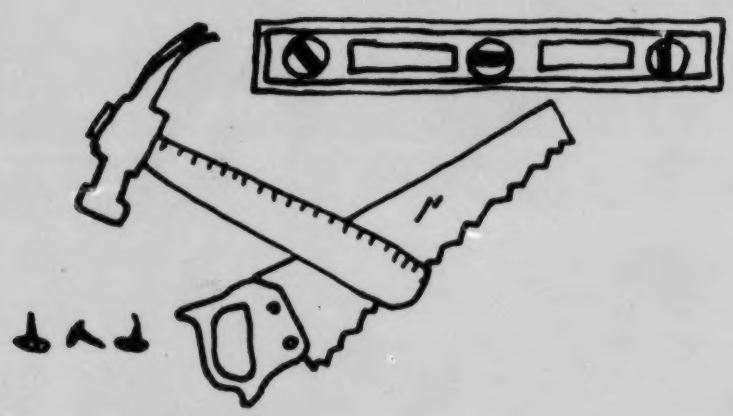


Carpenter

DECIDE 9

You just finished one of the tasks carpenters do. You estimated the materials you needed to finish a job. You had to know about materials. You had to use math skills to find out how much material you would need.

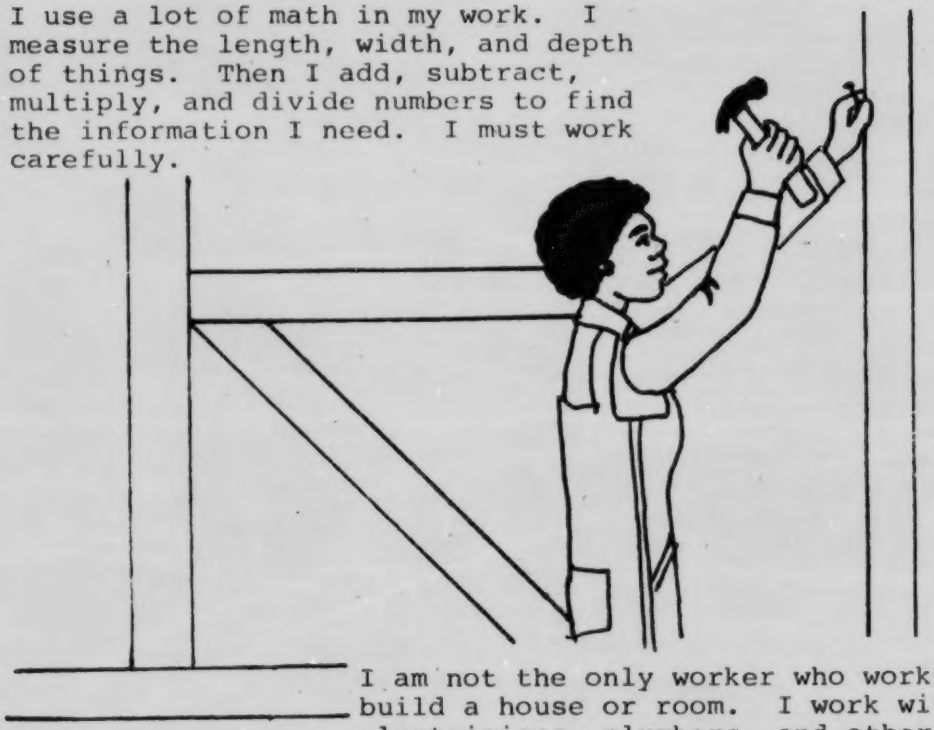
Carpenters do many other things on the job. The next pages will tell you more about a carpenter's job. Some of your questions about the job of carpenter can be answered by . . .



Talking with Donna Murray, carpenter for the Slick City Construction Company . . .

I do many kinds of carpentry. I put up the wood framework for houses. I put in windows, doors, and paneling. I build stairs. I put down hardwood floors.

I use a lot of math in my work. I measure the length, width, and depth of things. Then I add, subtract, multiply, and divide numbers to find the information I need. I must work carefully.

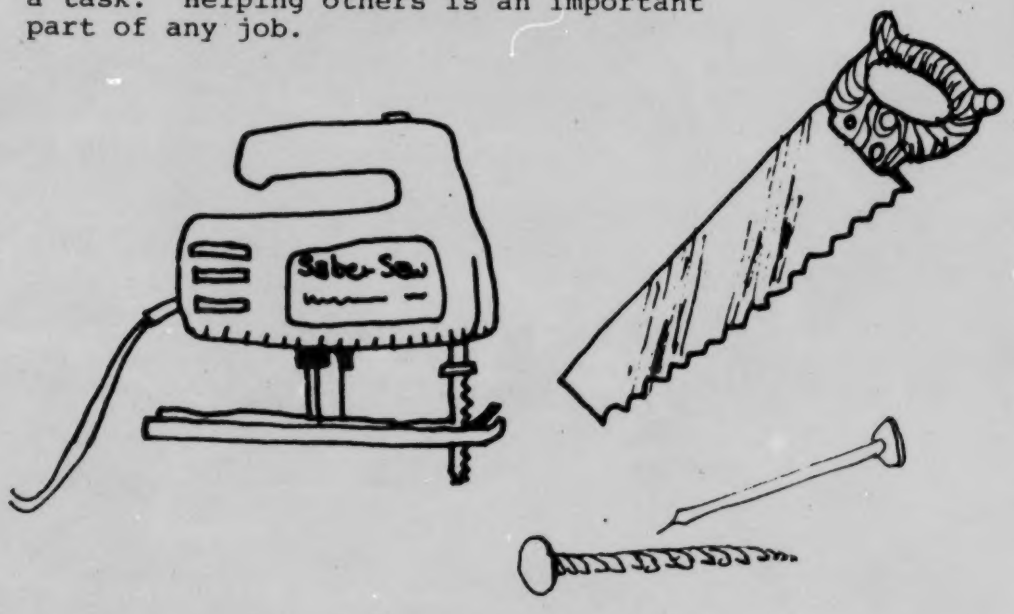


I am not the only worker who works to build a house or room. I work with electricians, plumbers, and other building and construction workers. We work together to finish a project. For example, I make sure the electrician puts all the wiring in the wall before I put up the paneling. It is easier that way. Carpenters must be able to cooperate and get along with other workers.

I use many different tools as I do my work. I use hand tools and power tools. Hammers, saws, and screwdrivers are hand tools. Power tools are tools that use electricity. Power saws, electric drills, and electric sanders are power tools.

It takes a lot of skill to know how to use each kind of tool and to know which tool is best for each job. Carpenters must know these things. They must also know what kinds of fasteners they need for each job. Fasteners join things together. Nails, screws, bolts, staples, and glue are fasteners.

I have learned many things by watching other carpenters and seeing how they do their work. Experienced workers usually enjoy telling others the best way to do a task. Helping others is an important part of any job.

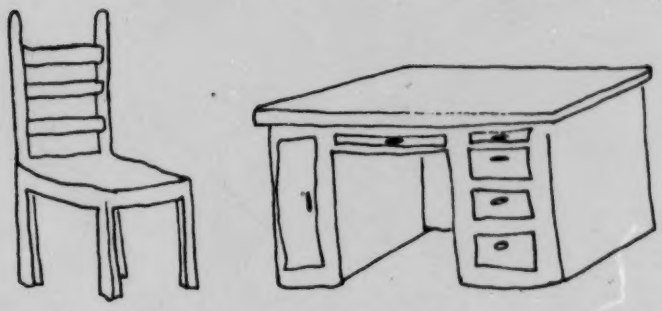


How did you prepare for your job?

I was an apprentice carpenter for 4 years. An apprentice is someone who learns from other workers. When I was an apprentice, I learned from other workers while I worked.

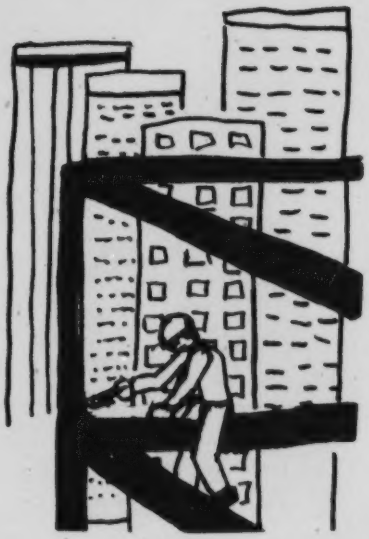
I had to go to a classroom for 144 hours, too. I learned about tools, materials, and how buildings are designed. I learned many ways to build things and how to finish wood products (make them look beautiful by sanding and painting the wood). I learned how carpenters work with people in other building trades.

In my state, you must be between 17 and 27 years old to be an apprentice. You also need a high school diploma.



After being an apprentice for 4 years, I became a journeyman. A journeyman has very good skills. I took a special test to become a master carpenter. A master carpenter knows how to build houses, and even furniture like desks, tables, and chairs.

Do all carpenters do the same things that you do?



Carpenters who work in building construction usually do the same things I do, although such carpenters work in many different places. Some of them work in high places. They work on tall buildings and on bridges. These carpenters cannot be afraid of high places. Some work outside. They must be able to work when it is cold or hot outside.

Other carpenters build furniture and cabinets. These carpenters work indoors. They are never too hot or too cold like I frequently am.

What hours do you work?

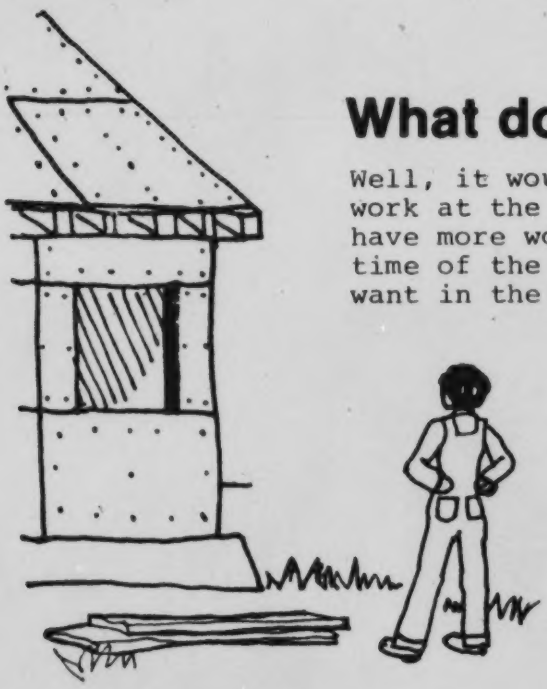
My hours depend on the time of year. When the weather is warm, I work long hours, sometimes until late at night. This is because workers cannot build homes when it is too cold. Therefore, they have much to do when it gets warm. Owners don't like waiting too long for their houses to be built.

What is the employment outlook?

Although new home construction is slowing down, carpenters with many skills will find work. Most of their work will be in construction. People will need carpenters as they add on rooms to their homes . . . and, as they remodel older parts of their homes. Few people have the skills and equipment to do the work a carpenter does.

What do you like most about your job?

I like working with my whole body. I like seeing houses that are well built. So do the owners. No one wants to have their paneling fall off the wall studs. Owners expect good work. I feel proud to help build houses people will like to live in!



What do you like least?

Well, it would be better if I could work at the same pace all year! I often have more work than I can do in the warm time of the year, and less work than I want in the winter.

How much money do you earn?

Many carpenters earn between $8.00 and $9.00 an hour. Beginning carpenters earn about $5 an hour. But they get raises about every 5 months. With a lot of experience, carpenters can earn $9.00 or $10.00 an hour. Most carpenters earn between $15,000 and $20,000 a year.

Do you want to learn more about this job?

You can get more education:

- Take the following courses in a high school or vocational school.

  Woodworking:

  Any shop course you can take, like woodworking, will teach you how to use tools and make things from wood or metal.

  Mathematics:

  Carpenters need mathematics to do their job.

  Mechanical Drawing:

  Carpenters must be able to read blueprints.

- Learn about some other occupations related to carpenters, such as . . .

  -bricklayer
  -boatbuilder
  -prop maker
  -wood lathe operator.

- Apply to be an apprentice in carpentry.

- Try to get some on-the-job training by working with a carpenter.

You can get some experience:

- Try to build some simple things from scrap wood. Ask your shop teacher to help you, or go to the library to find a book that tells you how to make things with wood.

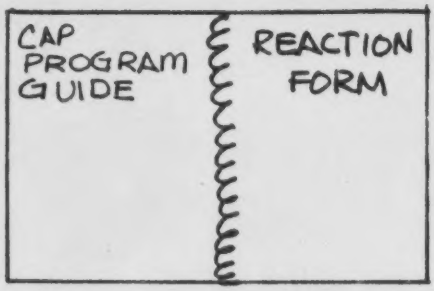
- Build stage sets and scenery for school plays.

- Get a part-time job at a lumber store and learn about tools and wood.

- Get a summer job as a carpenter's assistant.

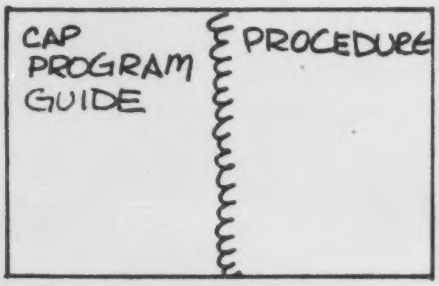
Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Answer the questions on the back of the Carpenter sheet.



What Next?

How many occupations have you investigated so far? Turn to the Procedure section of your Program Guide. Find the directions that apply to you.



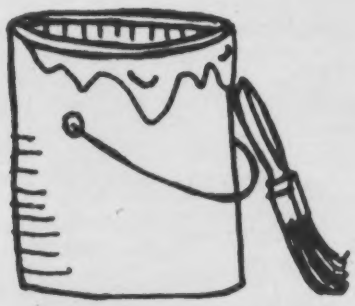
Enjoy the Career Alert Planning program!

Painter

PERFORM 10

Painters know about paint. They know what kind of paint to use in different places. Some paints are good in one place. They are not good in another place. For example, indoor paint is not good outdoors. Rain, sun, heat, and cold can damage indoor paint.

Selecting the proper paint is only one of the responsibilities painters have. There are others.



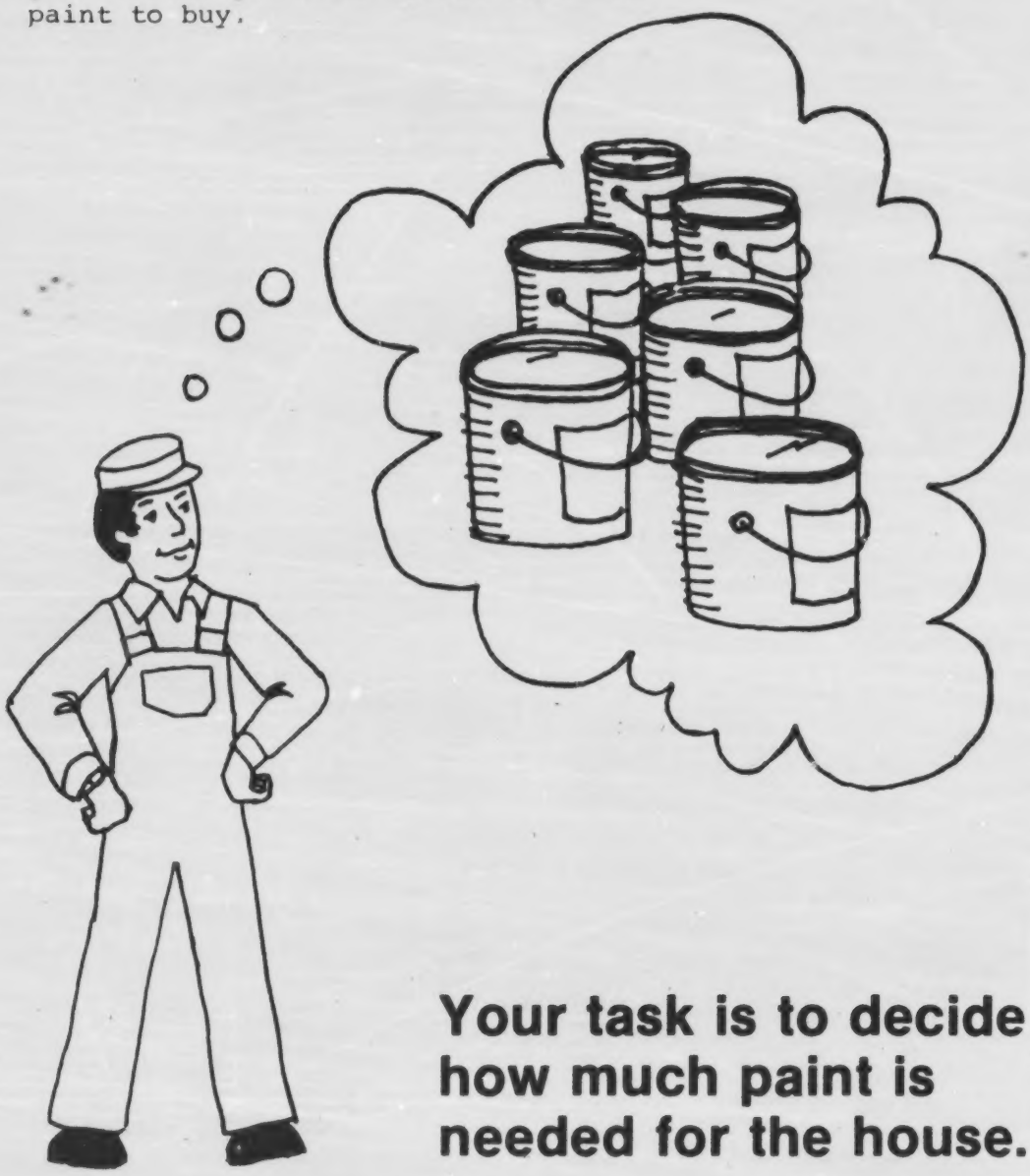
Responsibilities:

1. Plan the amount and kind of materials needed for the project.
2. Select the proper sheen and color of paint.
3. Mix paint and match colors.
4. Prepare walls for painting.
5. Apply paint, varnish, and other finishes.

You will learn about planning for needed materials as you PERFORM the following activity.

Imagine . . . YOU are a painter.

You work for the Rodino Construction Company. The company must paint the outside of a house. You will do the job. First you will decide how much paint to buy.



Your task is to decide how much paint is needed for the house.

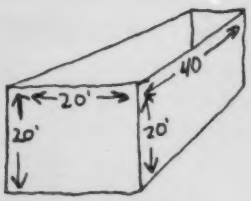
This is what you must do:

Find the size of the house to be painted

STEP 1.

Read the information below.

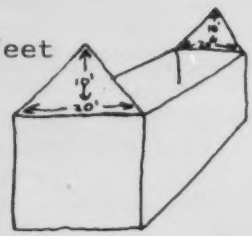
The House



a. The house has four outside walls.

b. The two side walls are 20 feet high and 40 feet wide.

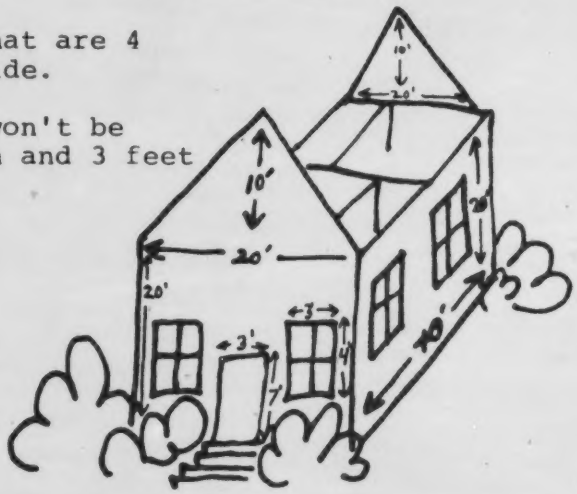
c. The front and back walls are 20 feet high and 20 feet wide.



d. The triangular part in front and back is 10 feet high and 20 feet wide at the bottom (the base) of the triangle.

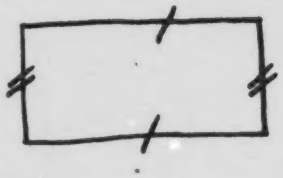
e. There are 10 windows that are 4 feet high and 3 feet wide.

f. The front door, which won't be painted, is 7 feet high and 3 feet wide.



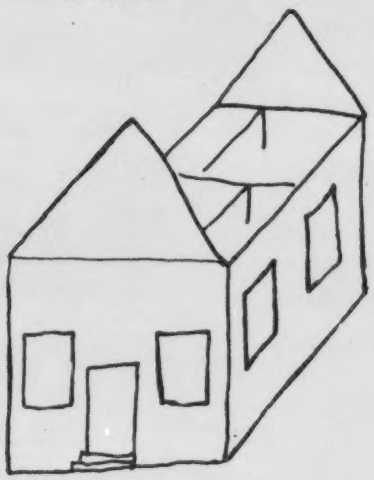
STEP 2.

List the dimensions of the rectangle-shaped parts of the house. (A rectangle has four sides. The opposite sides are equal--the same length.)



a. Turn to Worksheet 10a, Painter. Read the instructions.

b. Fill in the answers in Part 1 of the worksheet.



STEP 3.

List the dimensions of the triangle-shaped outside walls. (A triangle has three sides.)

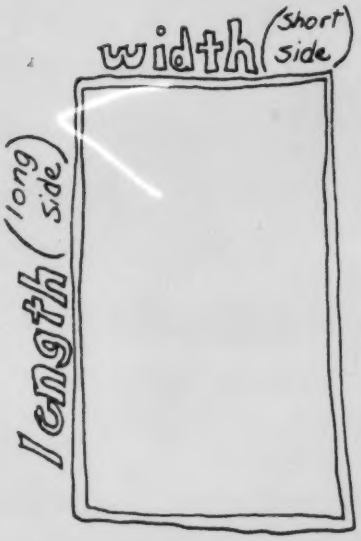
a. Turn to Worksheet 10a, Painter.

b. Fill in the answers in Part 2 of the worksheet.

Find the area of the rectangle-shaped outside walls

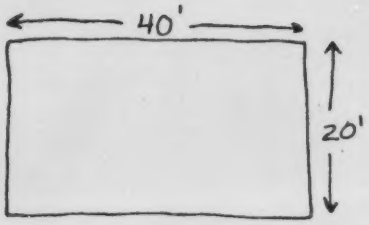
STEP 1.

Find the area of any rectangle. The area of a rectangle is found by multiplying the length by the width.



a. Do the problems on Worksheet 10b, Painter.

b. Check your answers with the key at the bottom of the worksheet.



20' X 40' = ?

x 2

?

STEP 2.

Find the area of the side walls.

a. Find the length and width of the side walls.

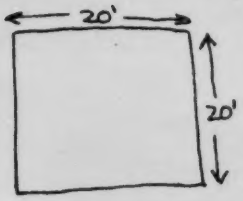
b. Multiply the length by width to find the area of one wall.

c. Multiply the area of one wall by 2 to find the area of both walls.

d. Write your answers on Part 3 of Worksheet 10a, Painter.

STEP 3.

Find the area of the front end wall.



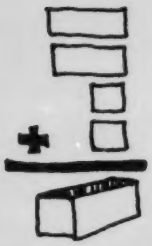
a. Multiply length by width.

20 x 20 =

b. Write your answers on Part 3 of Worksheet 10a, Painter.

STEP 4.

Find the area of the back end wall.



a. Multiply length by width

20 x 20 =

b. Write your answers on Part 3 of Worksheet 10a, Painter.

STEP 5.

Find the total area of the 4 walls.

a. Add up:

the area of the side walls
+ the area of the front wall
+ the area of the back wall
total wall area

b. Write your answers on Part 3 of Worksheet 10a, Painter.

Find the area of the rectangle shapes on the outside walls that are <u>not</u> to be painted

STEP 1.

Find the area of the front door. The front door will not be painted.

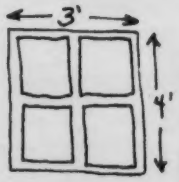
a. Multiply 7' x 3'.

b. Write that number on Part 4 of Worksheet 10a, Painter.

STEP 2.

Find the area of the windows. The windows will not be painted.

(10)



a. Multiply 4' x 3'.

b. Multiply your answer by the number of windows (10) to find the total window area.

c. Write that number on Part 4 of Worksheet 10a, Painter.

STEP 3.

Find the total area that will not be painted.

a. Add the area of the door to the area of the 10 windows.

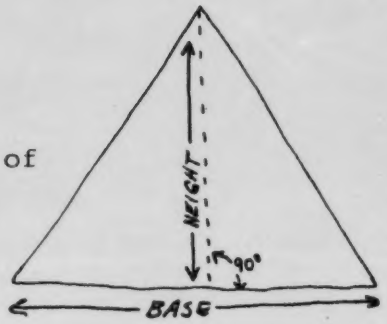
b. Write your answer on Part 4 of Worksheet 10a, Painter.

Find the area of the triangle-shaped parts of the house

STEP 1.

Find the area of a triangle.

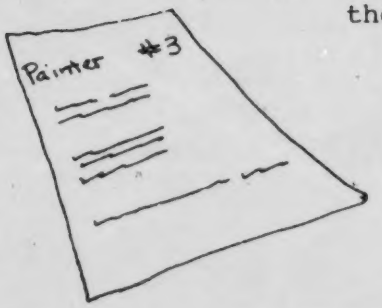
The area of a triangle is one-half of the base times the height.



$$\left(\frac{1}{2} \times \text{base}\right) \times \text{height} = \triangle \text{ area}$$

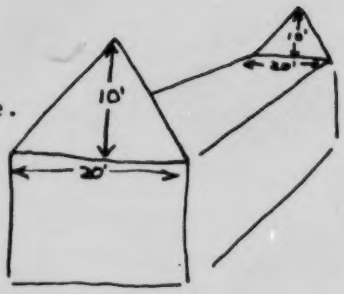
a. Do the problems on Worksheet 10c, Painter.

b. Check your answers with the key at the bottom of the worksheet.



STEP 2.

Find the area of the triangle parts above the front and back ends of the house.



a. Find the length and width of the triangles at each end of the house.

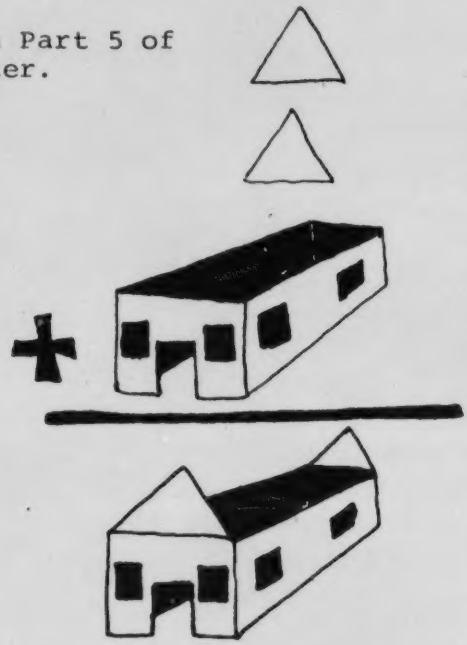
b. Multiply the length by width to find the area of one triangle.

c. Now, find the area of the other triangle. Did you get the same answer? Good! Both triangles are the same size.

d. Add the area of the two triangles.

Area of triangle 1
+ Area of triangle 2
Total area of triangle parts of house

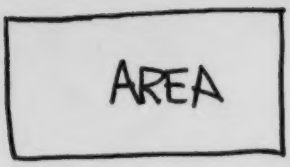
e. Write this number on Part 5 of Worksheet 10a, Painter.



Find the total area to be painted

STEP 1.

Add the total area of the rectangle-shaped walls and the total area of the triangle-shaped walls.



STEP 2.

Write your answer on Part 6 of Worksheet 10a, Painter.

STEP 3.

Subtract the total area of the unpainted parts of the house. Your answer is the total area to be painted.

STEP 4.

Write this answer on Part 6 of Worksheet 10a, Painter.

NOW YOU KNOW HOW MUCH AREA
YOU MUST COVER WITH PAINT!

Figure out how much paint you need to cover the area to be painted

STEP 1.

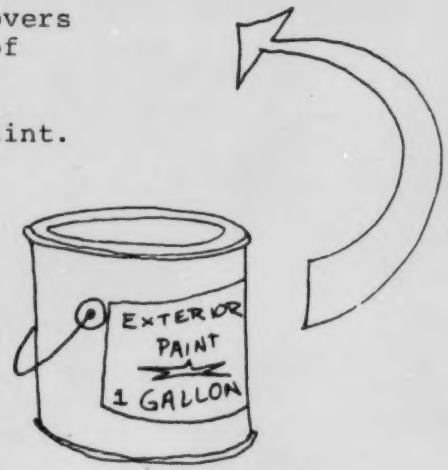
Read about the paint you will use.

a. You will use exterior (outside) paint.

b. One gallon of exterior paint covers 400 square feet with one coat of paint.

c. The house needs two coats of paint.

400 square feet



(2 x area) ÷ 400 = gallons

STEP 2.

Figure out how much area you must cover with two coats of paint.

a. Multiply the area by 2. If the house needs two coats of paint, that is the same as doubling the area to be painted.

b. Write your answer on Part 7 of Worksheet 10a, Painter.

STEP 3.

Figure out how many gallons of paint you will need.

a. Remember how many square feet each gallon of paint will cover.

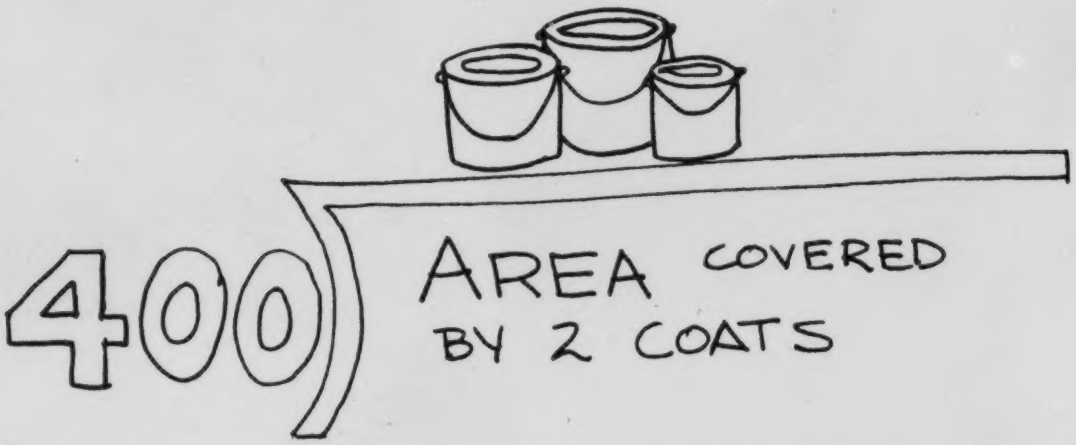
1 gallon = 400 sq. ft.

b. Divide the total area to be covered by two coats with 400.

$$\frac{\text{gallons of paint}}{400/\text{area covered by 2 coats}}$$

Remember that if you need any part of a gallon to finish, you must buy a whole gallon.

c. Write your answers on Part 7 of Worksheet 10a, Painter.



Check your work

STEP 1.

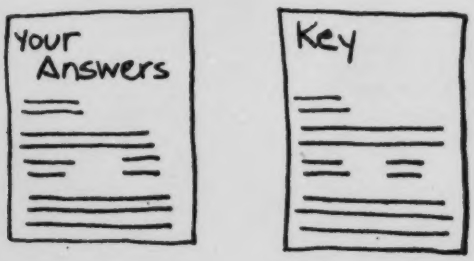
Check your answers with those on the key. The key is on the last page of Worksheet 10a.

STEP 2.

If your answers are wrong, work on them until you get the right answers.

STEP 3.

If your answers are right, continue reading.



Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Find the Painter page. Record your feelings about your interests and abilities in this activity. Then, return to this booklet and read the next page.

Did you like being a painter? Yes?
Then here are

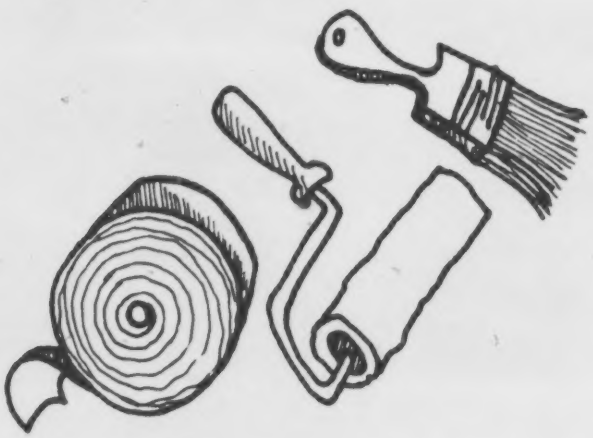
Some other activities:

1. Ask to visit a place where some contractors are painting. Watch the painters. Get some ideas about the tools and methods used in painting.

2. The next time someone is doing some painting in your neighborhood, ask if you can watch or help them paint.

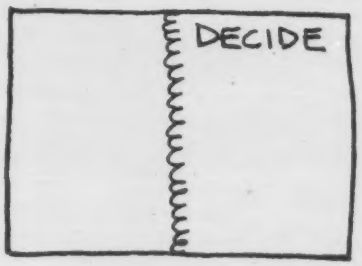
3. How many painting tools can you think of? Write them on a piece of paper.

4. If you had to paint your house or apartment, what colors of paint would you use? What kinds of paint would you use? How many gallons of paint would you need?



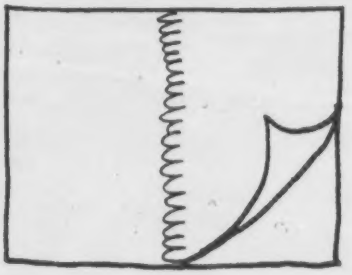
Would you like to find out more about this occupation?

yes ▶ Read DECIDE 10--Painter.



no ▶ Turn to another Building and Making occupation:

Occupation 9--Carpenter
Occupation 11--Roofer
Occupation 12--Drafter



or ▶ Look at the Self-Inventory Chart in your CAP Program Guide. Select another job function to investigate.

Painter

DECIDE 10

You just finished one of the tasks painters do every day. You used math to find out how much paint you need for a job.

This is just part of a painter's work. The following pages will tell you more. They will answer some questions about a painter's job.

Talking with Jimmy Wolinski, painter for the Safeway Construction Company . . .

Hi! I keep very busy working for the Safeway Construction Company. I put paint, varnish, and other finishes on buildings. I paint walls, ceilings, floors, stairs, and other surfaces. Paint protects the surfaces and makes them look nice.

I must prepare surfaces before I paint them. This means I must get them ready for painting. Sometimes, when the old paint is cracked and peeling, I have to remove it. Then, I scrape or burn the old paint off. If the old paint is good, I just sand it to make it smooth. I don't have to remove it.

I also remove dust, grease, and other dirt when I prepare a surface. (These keep the paint from staying on the surface.) I put a smooth paste in any cracks and dents in the surface. I work hard so that the new paint will look smooth and nice.

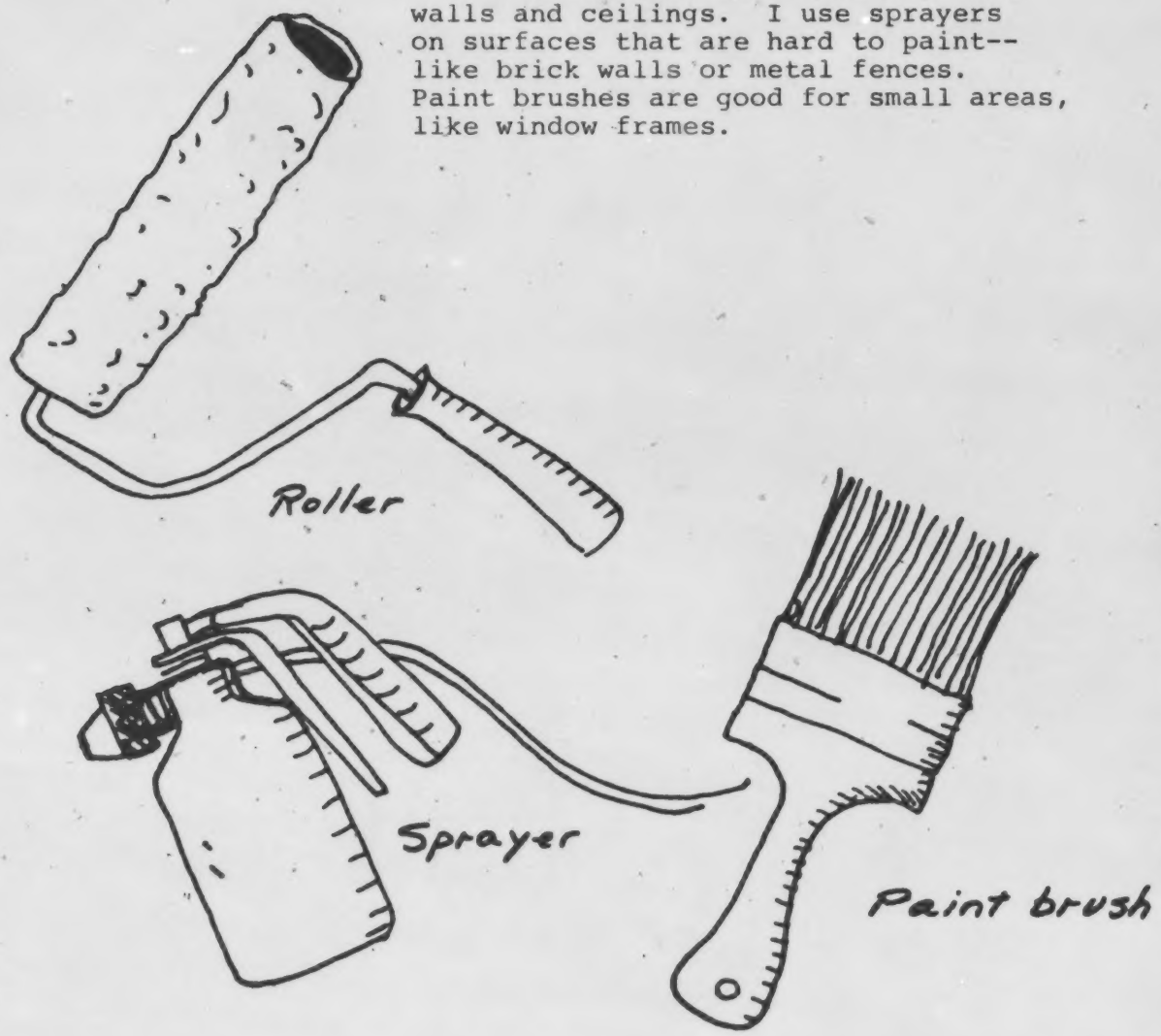
When I paint, I apply paint smoothly, quickly, and carefully--so there are no places that aren't painted.

I know how to mix paints and match colors. I know about different kinds of paint. I also know what the paint is made from. Sometimes I must look at old paint and find a new paint that is the same color.

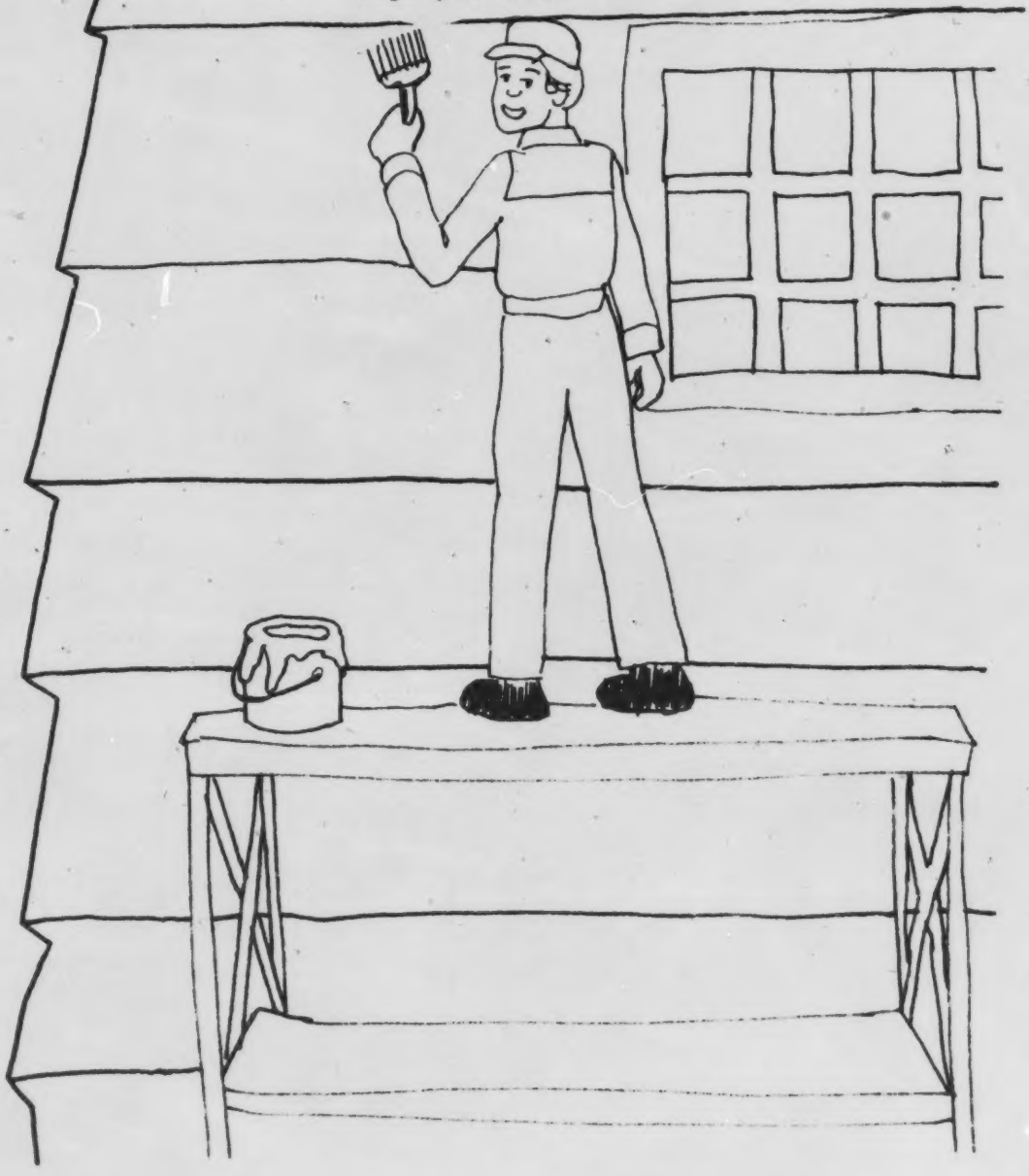
I know how long paints will stay on different surfaces. I also know what paints are easy to put on each kind of surface.

I work with many different tools. I use paint brushes, rollers, and sprayers. I know how to put on a smooth coat of paint with each tool.

I use rollers on flat surfaces, like walls and ceilings. I use sprayers on surfaces that are hard to paint--like brick walls or metal fences. Paint brushes are good for small areas, like window frames.



I work very hard all day long. I carry heavy equipment. I carry heavy buckets of paint, varnish, and other materials. I move ladders and scaffolding. Scaffolding is a platform that is placed on the side of a building for the painter to stand on. It helps the painter reach high places.



What do you like most about your job?

I like working in different places and with different people. I can work in different places because I work for a construction company. The company builds buildings all over the city.

I have a friend who paints the inside of City Hospital. I wouldn't like that--painting the same kind of walls in the same kind of rooms every day. But he says he wouldn't like my job as well as his own. He doesn't like painting surfaces in high places.

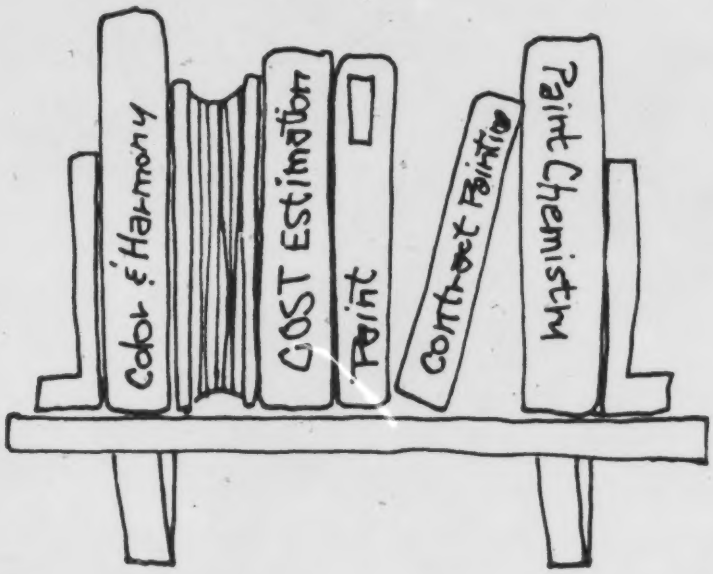
What do you like least?

I don't like to work in small places, like closets. It is too hard to move around and get the right angle with my paint brush.

How did you prepare for your job?

I was in an apprenticeship program for three years. I learned from other painters while I worked. In my state, an apprentice must be between 16 and 25 years old, strong, and healthy.

I spent 144 hours in a classroom I studied subjects like color harmony (colors that go together) and paint chemistry (what paint is made of). I also learned cost estimation (figuring out the cost of paints for a job), and mixing paints. I learned how to work with other painters.



Do all painters do the same things that you do?

Yes, although many painters work for building contractors (companies that build new homes and business buildings). These painters do not have to scrape off old paint because they only work on new buildings. Other painters, like me, work for contractors who repair and repaint older buildings.

Some painters work for businesses who have their own painters, such as hotels, offices, and schools. Other painters work for people who own their own homes. All painters help owners to keep their buildings looking nice.

How much money do you earn?

I earn about $7.00 an hour, but the pay is different in different cities. In some cities, painters earn only $5.00 an hour. In northern cities, painters may earn $6.00 to $10.00 an hour. Painters earn more in some cities because it costs more to live in those cities. Those with more experience can earn more money, too.

What hours do you work?

My hours are different every week--and sometimes every day. When there is a lot of work to be done, I work many hours a week.

I usually work a lot when the weather is nice. That is because I cannot paint outdoors when it is cold, raining, or snowing. I have to save that work until the weather is nice. Then, in the spring, I have twice as much to do.

What is the employment outlook?

The employment outlook for painters is the same as for other workers in the construction trades--average. There will always be a need for painters, but fewer will work in new homes and buildings. This is because building construction is expected to slow down. However, as fewer people move to new homes, they will need painters to keep their older homes looking nice and in good repair.

Do you want to learn more about this job?

You can get more education:

- Take the following courses in high school or vocational school.

  Industrial Arts:

  Painting is an important final step in finishing many industrial arts projects.

  Business Courses:

  If you want to start your own painting business, you should know how to run a business.

  Chemistry:

  Knowing about the chemicals that are in paints will help you know why certain paints can be mixed together.

- Learn about other jobs related to painter, such as . . .

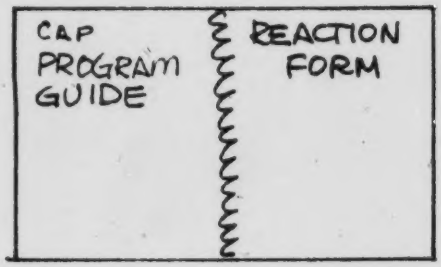
  -bridge painter
  -sign painter
  -wallpaper hanger
  -aircraft painter

- Apply for a painting apprenticeship.

You can get some experience:

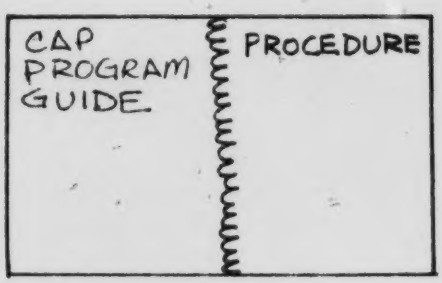
- Get a summer job painting houses or other buildings.
- When friends are painting houses or apartments, help them.
- Paint scenery for school plays.
- Apply for a job with a painting contractor.

Turn to the Building and Making Reaction Form in your Program Guide. Answer the questions on the back of the Painter sheet.



What Next?

How many occupations have you investigated so far? Turn to the Procedure section of your Program Guide. Find the directions that apply to you.

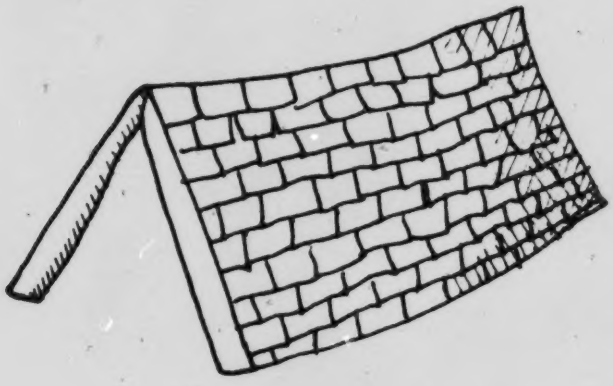


Enjoy the Career Alert Planning program!

Roofer

PERFORM 11

Roofers build and repair (fix) roofs. They use many kinds of materials and tools as they perform their responsibilities.



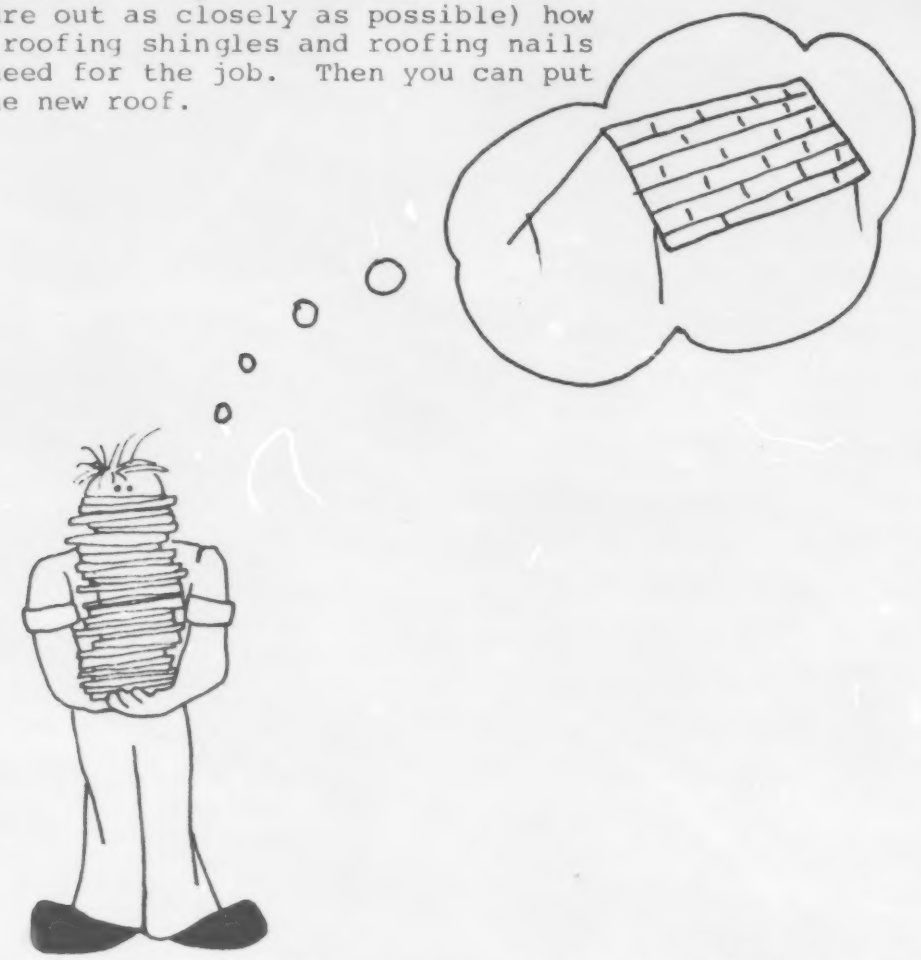
Responsibilities

1. Select (with customer or builder) the proper kind of roof for the house or building.
2. Understand and use blueprints, sketches, or drawings.
3. Plan the amount and kind of materials needed for the project.
4. Apply roofing material by following recommended procedures.
5. Measure and cut roofing material to fit around corners, pipes, and chimneys.

You will learn about planning for needed materials as you PERFORM the following activity.

Imagine . . . YOU are a roofer.

You work for the Topper Roofing Company. The company has a new job. The Norman family needs a new roof on their house. You will do the job. You must estimate (figure out as closely as possible) how many roofing shingles and roofing nails you need for the job. Then you can put on the new roof.



Your task is to find out how many shingles and pounds of nails will be needed for this job.

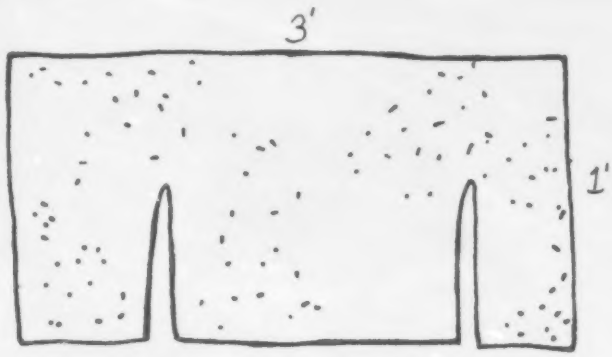
This is what you must do:

Identify roofing materials you will use

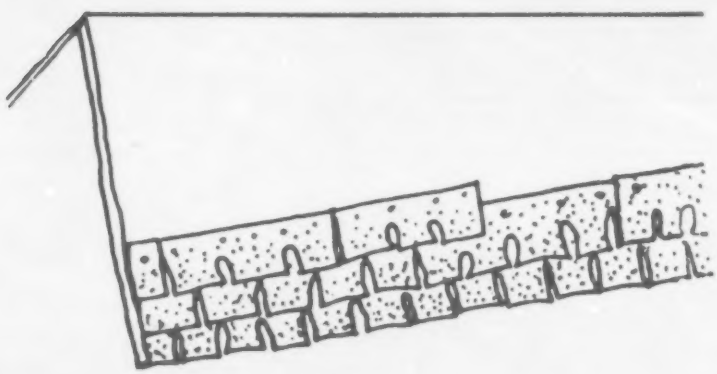
STEP 1.

Read the information that follows.

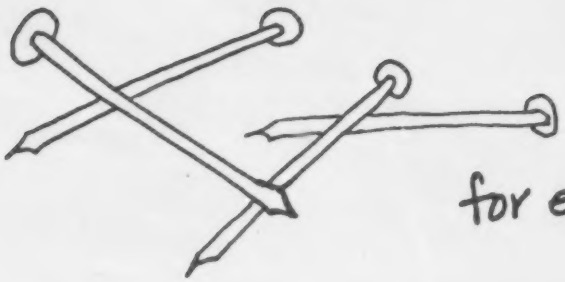
SHINGLES are thin pieces of wood, asphalt, or other material. They cover roofs and keep buildings dry. Each shingle is 1 foot wide and 3 feet long.



Shingles are laid on the roof in rows. Rows of shingles are overlapped (part of one shingle is on top of the next shingle). You will overlap the shingles like this. Every place on the roof has three layers of shingles on it.



NAILS are used to attach the shingles to the roof. You will use shingle nails. The nails are 1¼-inch long. Each shingle must have four nails.



for each

Nails are sold by the pound. The store clerk weighs the nails. You must tell the clerk how many pounds of nails you need. About 280 shingle nails weigh one pound.

STEP 2.

Complete the sentences about roofing tools and materials.

a. Turn to Worksheet 11a, Roofer.

b. Follow the instructions on the worksheet.

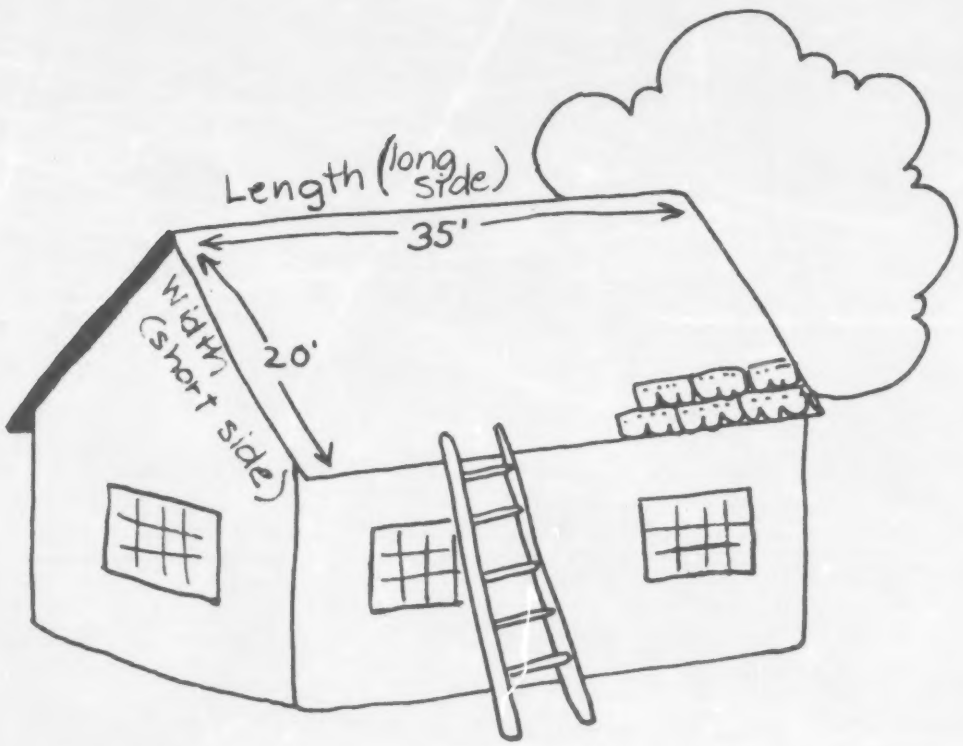
Find out the size of the roof

STEP 1.

Look at the picture below. Each side of the roof is a rectangle. Find the length and width of the roof.

STEP 2.

Write the dimensions on Part 1 of Worksheet 11c, Roofer. (Skip Worksheet 11b. You will use it later.)



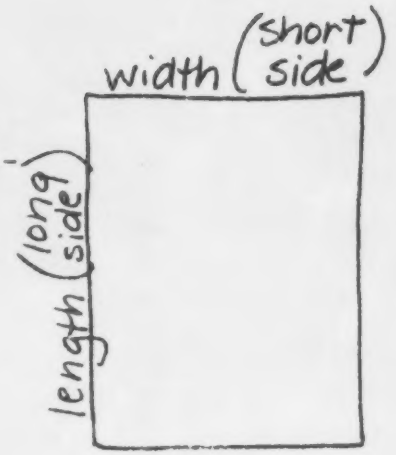
Find the area of the roof

STEP 1.

Find the area of any rectangle. The area of a rectangle is found by multiplying the length by the width.

a. Do the problems on Worksheet 11b, Roofer.

b. Check your answers with the Key at the bottom of the worksheet.



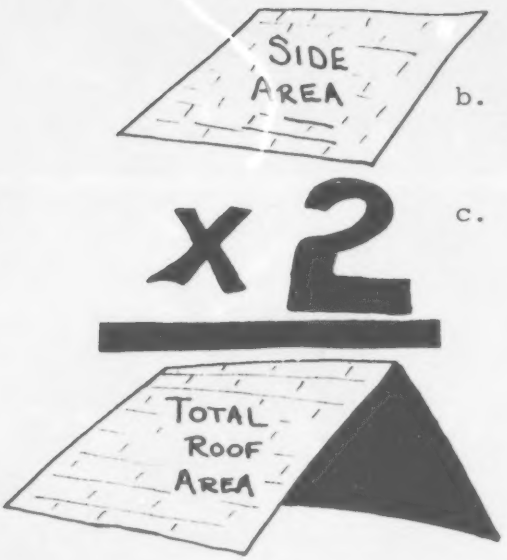
STEP 2.

Find the total area of the roof.

a. Multiply the length of the roof by the width to find the area of one side of the roof.

b. Multiply that answer by 2 to find the total area (the area of side 1 plus side 2).

c. Write your answers on Part 2 of Worksheet 11c, Roofer.

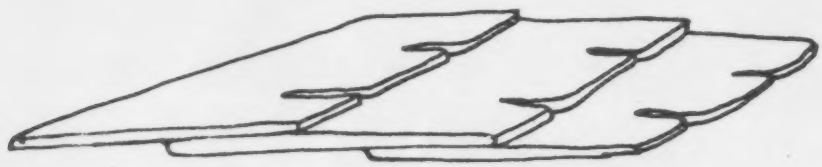


Find the area you will cover with shingles

STEP 1.

Read to find how many shingles cover each area of the roof.

The roof is covered by 3 layers of shingles. The total area of the roof is covered 3 times.

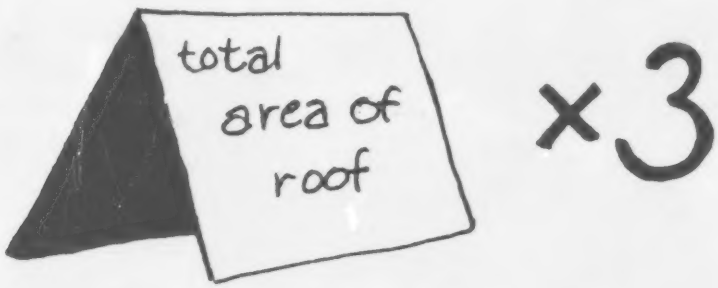


STEP 2.

Multiply the total area of the roof by 3.

a. Write the total area of the roof on Part 3 of Worksheet 11c, Roofer.

b. Multiply the total area of the roof by 3. Your answer is the area you will cover with shingles.



STEP 3.

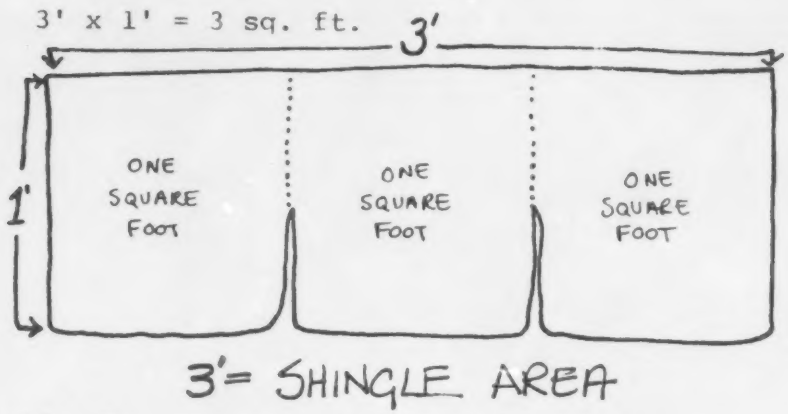
Write your answer on Part 3 of Worksheet 11c, Roofer.

Figure out the number of materials you will need

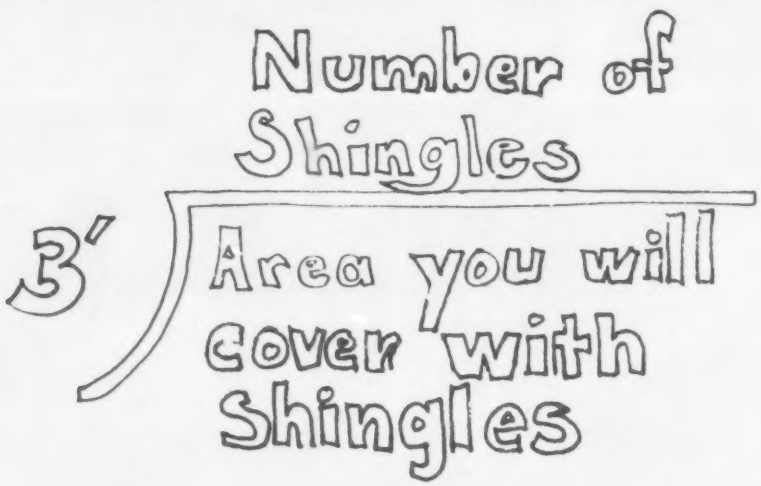
STEP 1.

Figure out how many shingles you will need.

a. Figure out the area of one shingle. A shingle is a rectangle. Multiply length x width.



b. Divide the area you will cover with shingles by the area of one shingle.



c. Write your answers on Part 4 of Worksheet 11c, Roofer.

STEP 2.

Figure out how many nails you will need.

a. You need 4 nails for each shingle. Multiply the number of shingles by 4.

b. Write your answers on Part 5 of Worksheet 11c, Roofer.

Shingles
x 4
Nails

STEP 3.

a. Figure out how many pounds of nails you will buy.

There are about 280 nails in a pound. Divide the number of nails by 280. Your answer is the number of pounds of nails you need.

b. Write your answers on Part 6 of Worksheet 11c, Roofer.

Pounds
280) Nails

Check your work

STEP 1.

Check your answers with the key. The key is on the back of Worksheet 11c, Roofer.

STEP 2.

If your answers are wrong, work on them until you get the right answers.

STEP 3.

If your answers are right, continue reading.

Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Find the Roofer page. Record your feelings about your interests and abilities in this activity. Then, return to this booklet and read the next page.

Did you like being a roofer? Yes?
Then here are

Some other activities:

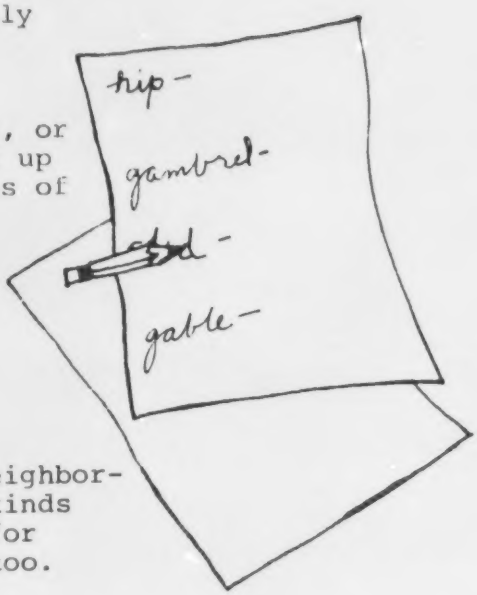
1. Plan a trip to where a roofer is working. Ask the roofer about different kinds of roofs and roofing materials.

2. Plan a trip to a building supply house. Look at the different roofing materials.

3. Use a dictionary, encyclopedia, or a book on construction to look up "roofing." Find out the shapes of each of these kinds of roofs:

   a. Hip
   b. Gambrel
   c. Shed
   d. Gable

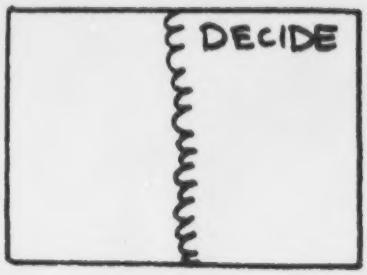
   Draw a picture of each one.



4. When you're walking in your neighborhood, see how many different kinds of roofs you can spot. Look for different kinds of shingles, too.

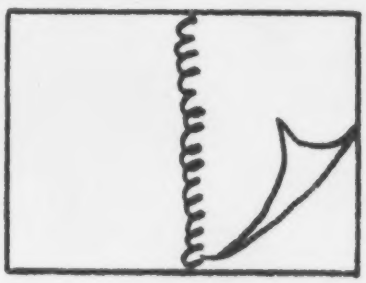
Would you like to find out more about this occupation?

yes Read DECIDE 11--Roofer.



no Turn to another Building and Making occupation:

Occupation 9--Carpenter
Occupation 10--Painter
Occupation 12--Drafter



or Look at the Self-Inventory Chart in your CAP Program Guide. Select another job function to investigate.

Roofer

DECIDE 11

You just finished one of the tasks roofers do. You found out how much roofing material to order for the job.

You may want to learn about other things roofers do. The following pages will answer some questions about roofing work. These answers may help you decide if you would like to work as a roofer.

81

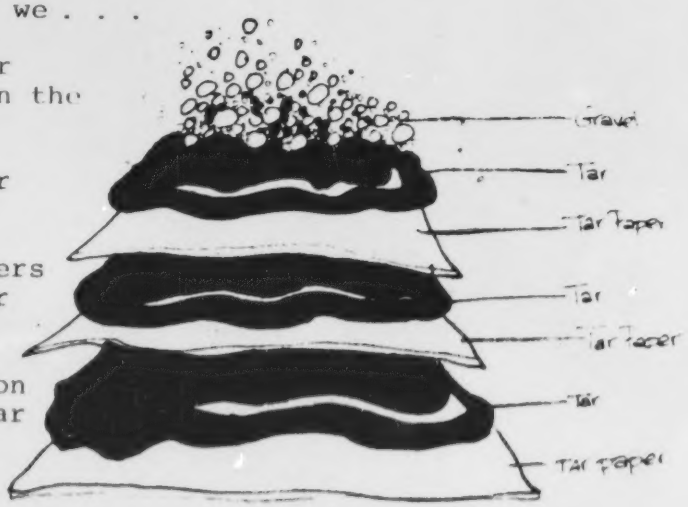
We use many different kinds of roofing. We use shingles, metal, tile, and slate. Each kind of material is put on a roof in a special way.

To put on tile and slate roofs, we have to drill holes in the tile first. Then we put a piece of felt on the wooden part of the roof. We then nail the shingles to the felt covering the wood roof. All of the shingles overlap so you don't see the nails.

Last month we put a new roof on the Buckeye Building--a tall office building.

To put on a gravel roof we . . .

- put tar paper (paper covered with tar) on the roof
- then we put tar over the paper
- we put two more layers of tar paper and tar on the roof
- then we put gravel on the last layer of tar to protect the roof from the weather



Talking with Lou Cusella, roofer for Debonner Contracting, Inc. . . .

Our company has 8 roofers. We put new roofs on buildings. Sometimes we fix old roofs.

We work hard! We lift heavy materials. We climb to high roofs. We work in the hot sun. Roofers do a lot of physical work.

We use many different kinds of roofing. We use shingles, metal, tile, and slate. Each kind of material is put on a roof in a special way.

To put on tile and slate roofs, we have to drill holes in the tile first. Then we put a piece of felt on the wooden part of the roof. We then nail the shingles to the felt covering the wood roof. All of the shingles overlap so you don't see the nails.

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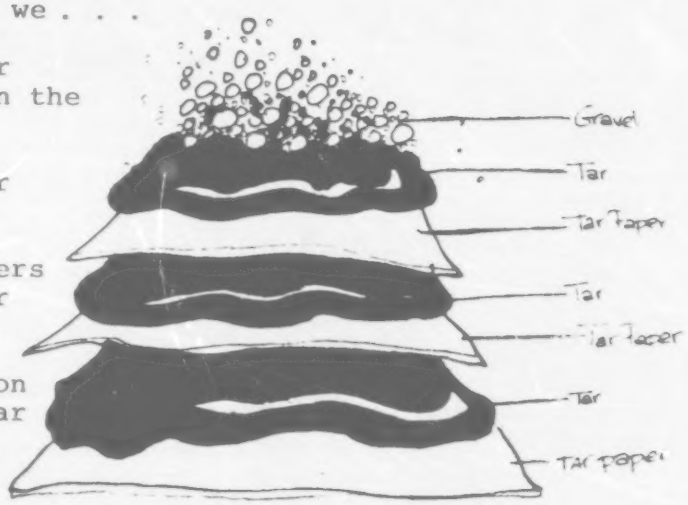
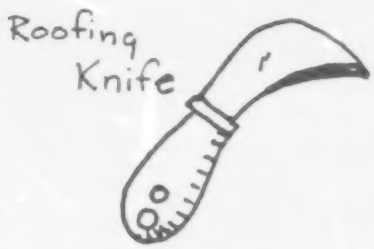
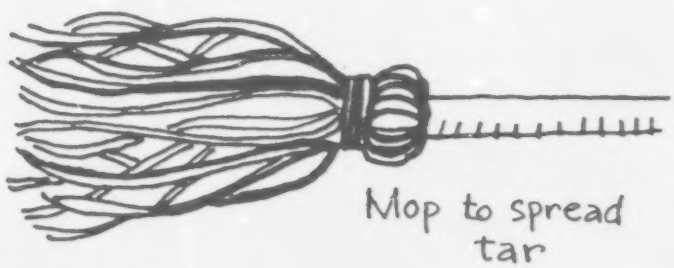


How did you prepare for your job?

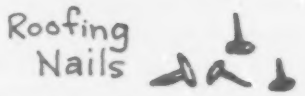
Some people learn roofing by getting summer or part-time jobs with roofing businesses. They start as helpers. They learn from experienced roofers.

I learned how to be a roofer by being an apprentice (someone who works while learning from other workers). I had 1400 hours of on-the-job training. I also had 144 hours of classroom training. Apprenticeship programs are three years long.





I took courses in safety, math, and tools. I learned to use hand tools such as hammers and roofing knives. I learned to use machines to put caulking (insulation material) into small cracks. I also learned to use painting tools and mops to spread tar and other liquid roofing materials on the roofs.



What do you like most about your job? What do you like least?

There are two things I like about my job. I like physical work--but sometimes I get very, very tired. I like working outdoors. But when it is very hot, I'd rather be working anywhere else than on a hot roof! So you see, there are good and bad parts of everything I do. But, that's true for all workers.

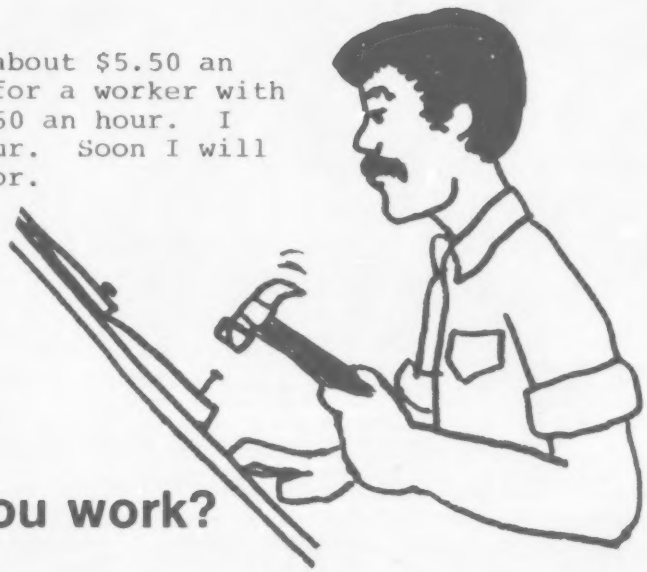
Do all roofers do the same things that you do?

Yes, and many roofers work for contractors, too. A contractor is a person who builds homes or other buildings. We put roofs on new buildings. Sometimes we repair roofs on old buildings.

Some roofers have their own business. They must know a lot about business management.

How much money do you earn?

Beginning roofers earn about $5.50 an hour. The average pay for a worker with experience is about $9.60 an hour. I earn about $10.00 an hour. Soon I will be promoted to supervisor.



What hours do you work?

My hours depend a lot on the weather. I work many hours in the fall and spring when the weather is nice and the days are long. You cannot put on a roof when it is raining and lightning. You cannot put on a roof at night, either.

What is the employment outlook?

The employment outlook is average. Much work can only be done in good weather. Roofers may have to find other work in the winter months if they work in the cooler climates.

Do you want to learn more about this job?

You can get more education:

- You can take the following courses in high school or vocational school.

  Shop Courses:

  It is important for roofers to know how to use hand tools.

  Mechanical Drawing:

  Roofers sometimes need to read building plans.

  Mathematics:

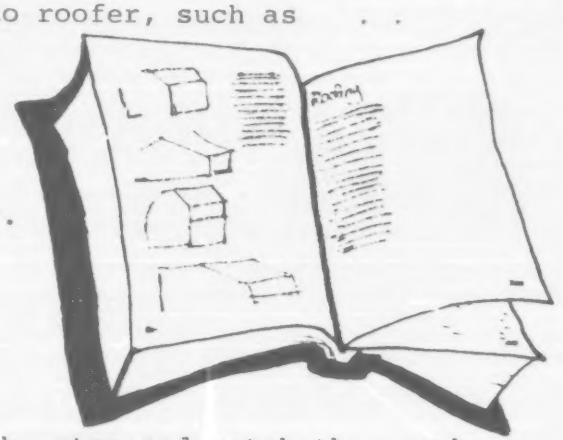
  Roofers use math to find out how much material to use on the job.

- Get books from the library about jobs in construction and roofing businesses.

- Learn about other jobs related to roofer, such as . .

  -sheet-metal worker
  -roof waterproofer
  -chimney builder
  -stucco mason

- Apply to be an apprentice roofer.



You can get some experience:

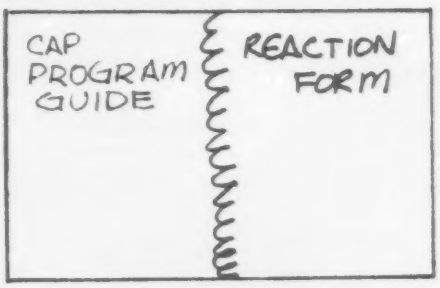
- Next time you see roofers at work, stop and watch them work (if they don't mind).

- Get a summer job with a roofing contractor.

- Apply for a job with a roofing contractor.

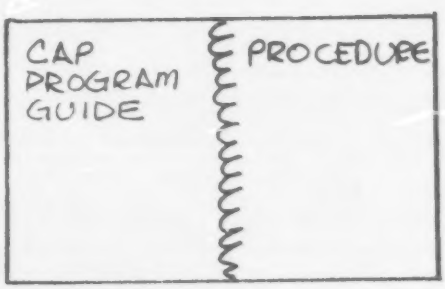
Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Answer the questions on the back of the Roofer sheet.



What Next?

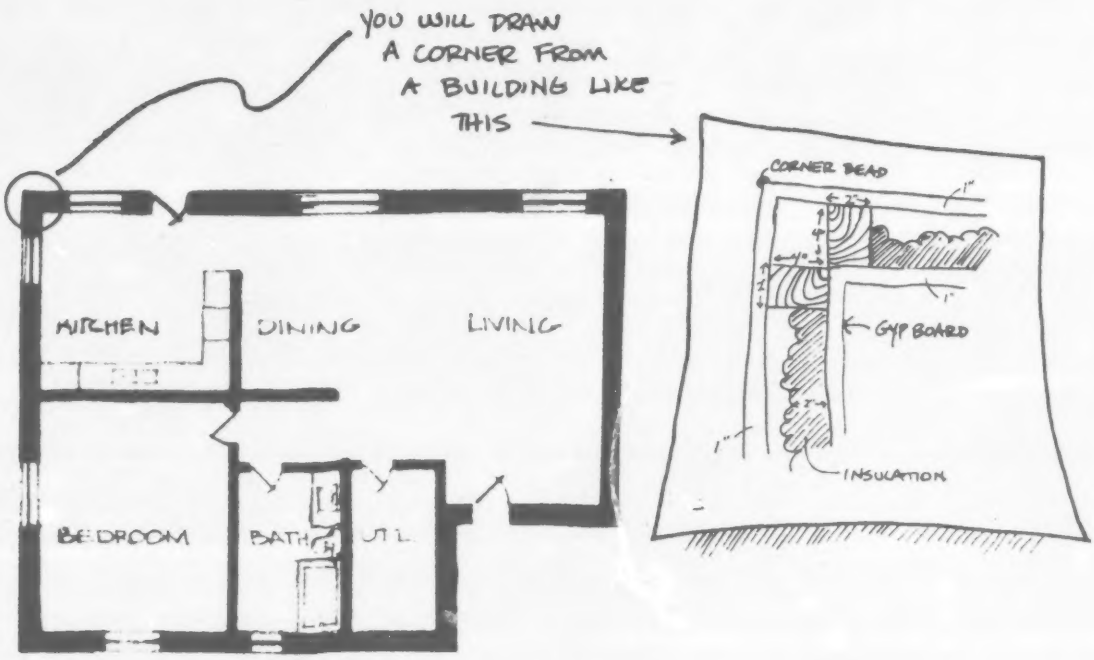
How many occupations have you investigated so far? Turn to the Procedure section of your Program Guide. Find the directions that apply to you.



Enjoy the Career Alert Planning program!

Drafter

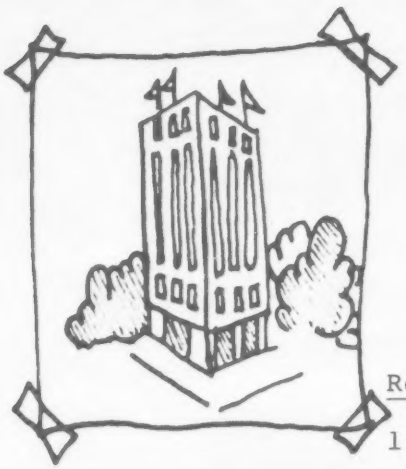
PERFORM 12



Drafters work with engineers, designers, or architects. They help plan the designs of machines, equipment, buildings, and other things.

Architects decide how buildings will look. They think about where rooms, windows, doors, and stairways will be. Then, they make rough drawings to show their ideas.

Drafters who work with architects take these rough drawings and prepare more detailed building plans. They make exact drawings called prints. These prints show builders what they must do to build the house, office, or other structure. You can see that drafters have a responsibility to make sure that something is properly built.



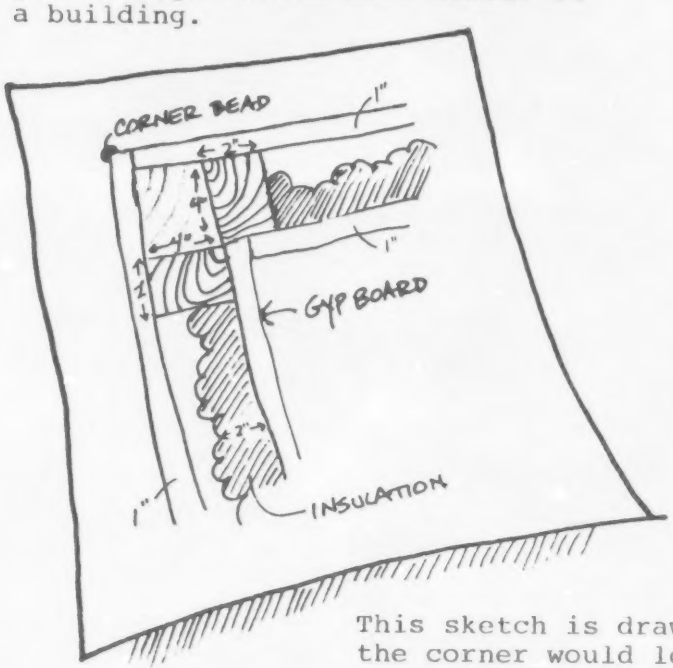
Responsibilities

1. Communicate with architects to learn their ideas and plans for the building project.
2. Study sketches to determine the size, shape, and arrangement of building parts.
3. Make detailed drawings based on rough sketches.
4. Figure out the strength, quality, quantity, and cost of materials.
5. List procedures builders should follow in carrying out the project.

You will learn about making detailed drawings as you PERFORM the following activity.

Imagine . . . YOU are a drafter.

You work for the J.A. Fuentes architectural firm. One of the architects in the firm has given you a rough sketch of a corner of a building.



This sketch is drawn to show you what the corner would look like if you were to cut through the wall and look down on the corner. You are to make an exact drawing from the sketch.

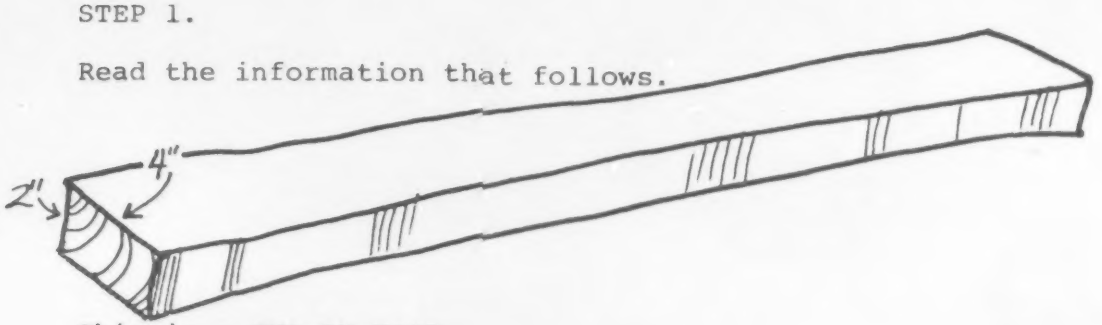
Your task is to take a rough sketch and turn it into a finished drawing.

This is what you must do:

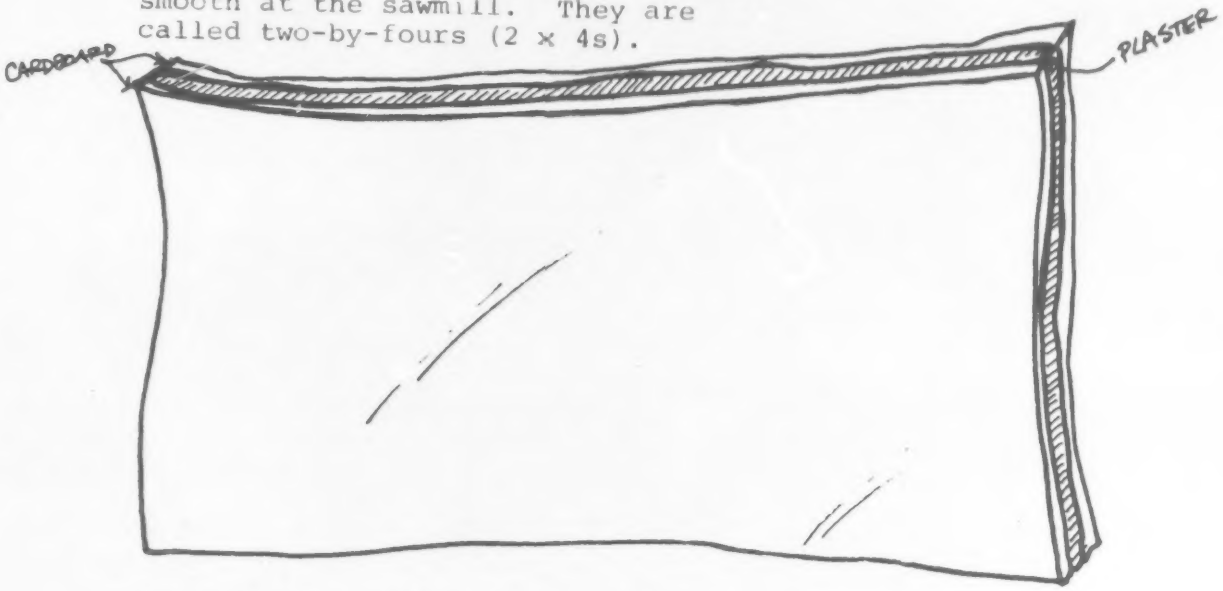
Identify the materials shown in the sketch

STEP 1.

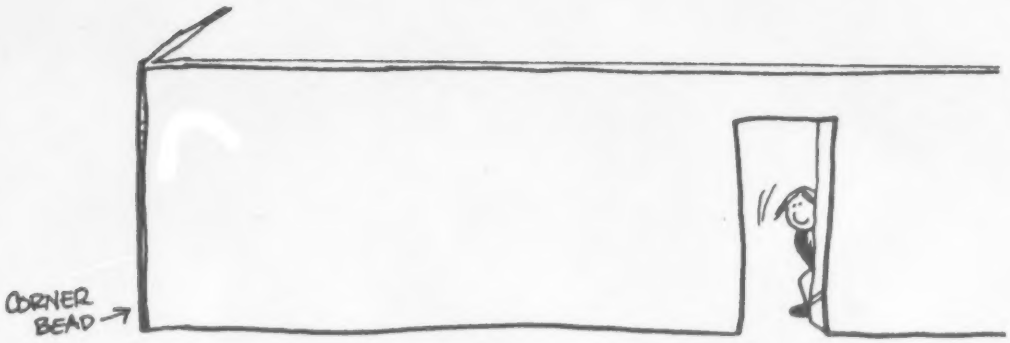
Read the information that follows.



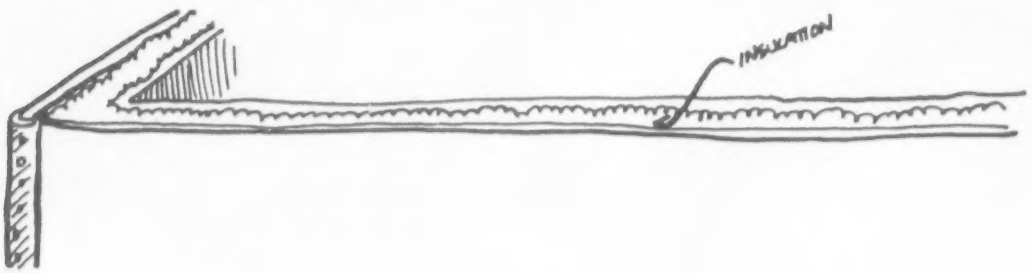
This is a TWO-BY-FOUR.
A two-by-four is 1 3/4 inches thick and 3 1/2 inches wide. These boards were 2" x 4" before they were planed smooth at the sawmill. They are called two-by-fours (2 x 4s).



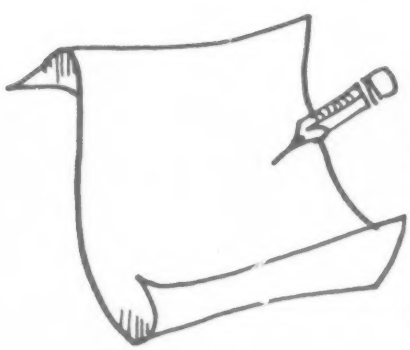
GYP BOARD is gypsum board. Gypsum board is also called wall board or plaster board. Gyp board is made like a sandwich. There are two layers of cardboard with plaster between the layers. The walls in your house or room might be made from gyp board.



A CORNER BEAD is a long, thin piece of metal. It is put on the corner of a wall. The corner bead protects the edges of the gyp board. When the corner is bumped, it won't break.



INSULATION is made from plastic, fiberglass, and other materials. Insulation keeps buildings warmer in the winter and cooler in the summer.



STEP 2.

Match the names of the materials to their definitions.

a. Turn to Worksheet 12a, Drafter.

b. Follow the directions on the worksheet.

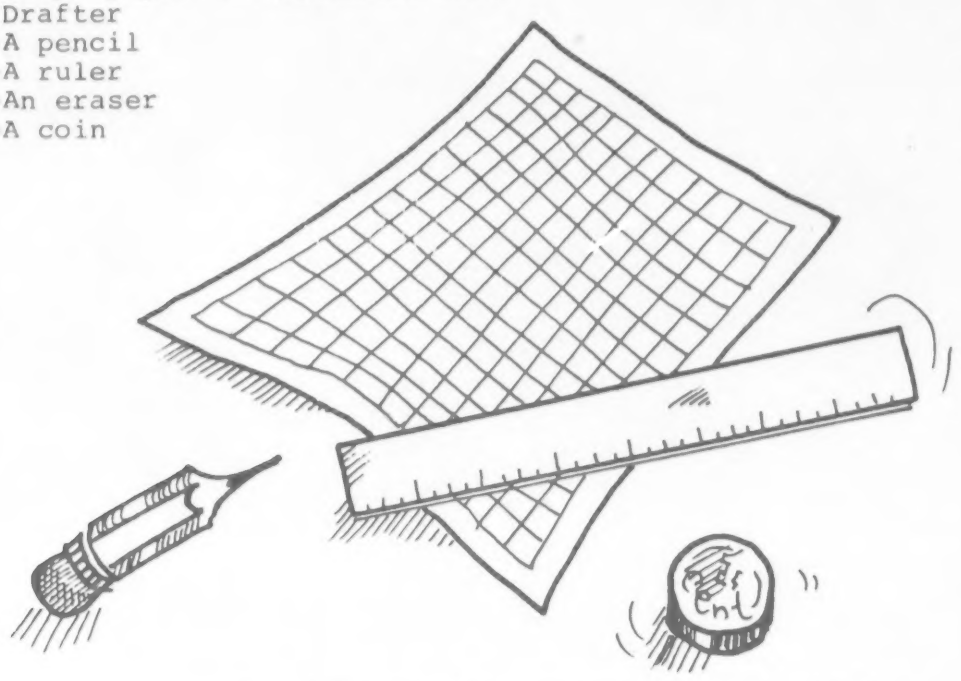
Find out the measurements you will use to draw the materials on the graph paper

STEP 1.

Find out the size of each square on the graph paper.

a. Get the following materials:

-Graph paper on Worksheet 12b, Drafter
-A pencil
-A ruler
-An eraser
-A coin



b. Look at the squares on your graph paper.

c. Measure a square. Each square is 1/4 inch on each side. Four squares equal one inch.

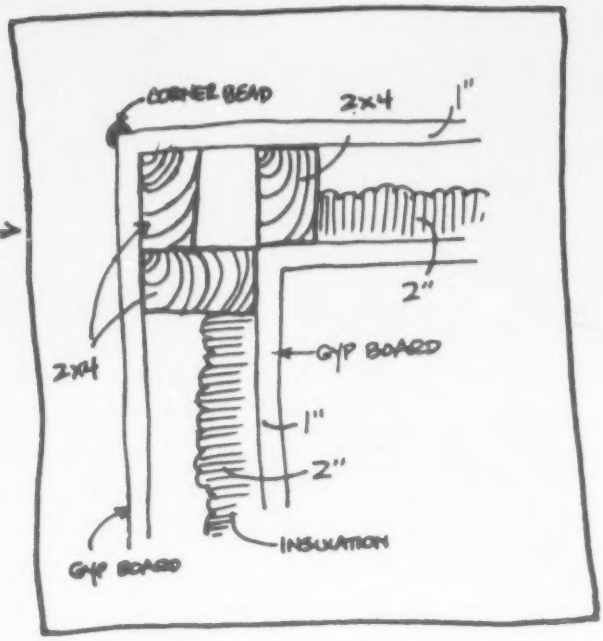
d. Decide on the scale for the drawing. If we made a drawing of a house full size, we would need a piece of paper as big as a house. Therefore, we must use a reduced scale. For this drawing, use half-scale--two squares equal one inch.

STEP 2.

Find out the measurements you will use to draw each item on the graph paper.

a. Look at the rough drawing. The drawing shows only the corner or the walls. The rest of the walls are not in the drawing. You need to look only at the corner.

ROUGH DRAWING →

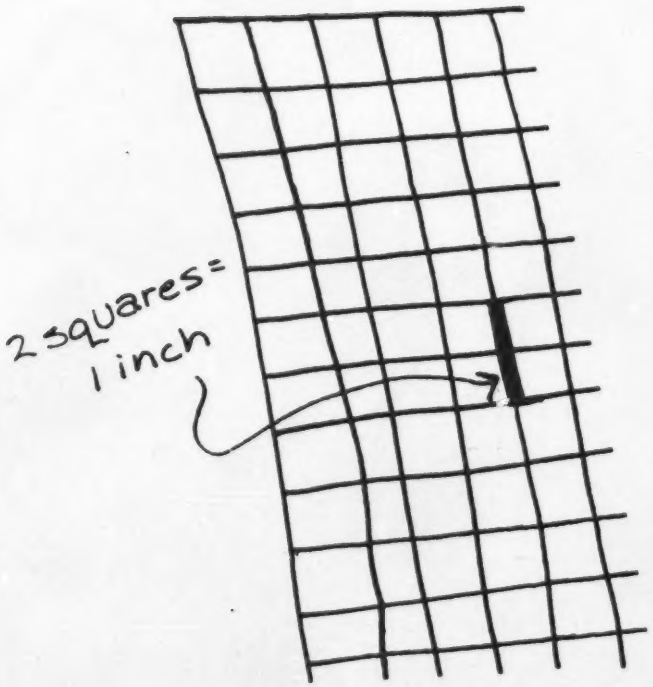


b. Find the numbers on the rough drawing. They tell how big each part is to be drawn. Remember, our scale for this drawing is two squares per inch.

Example:

The insulation is two inches wide. You will draw it four squares wide. Four squares equal two inches.

You will think about each part of the drawing the same way. You will decide how many squares equal each part.



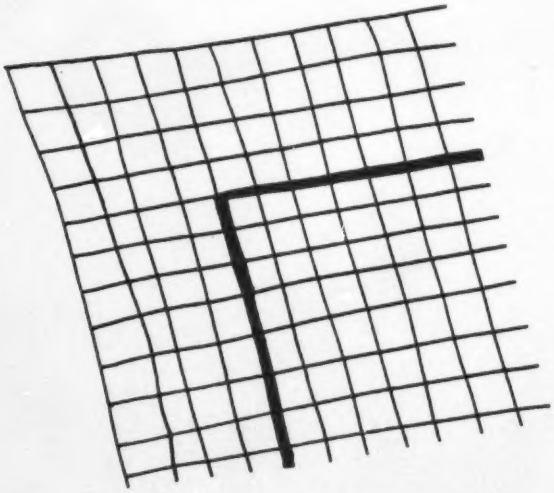
Make the exact drawing of
the corner on the graph paper

STEP 1.

Draw the straight lines on the outside of the corner. Make them as long as your graph paper allows.

a. Use your pencil and ruler to draw the straight lines. If you make a mistake, erase it and try again.

b. Place the outside corner about four squares in and four squares down from the upper left corner of your graph paper.



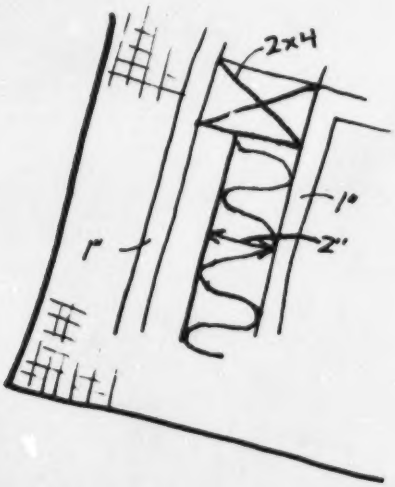
c. The outside wall is one inch thick. Remember . . . two squares equal one inch. Draw the inside lines of the outside wall two squares away from your first lines. End the lines about four squares from the edge of your paper.

STEP 2.

Put in the 2 x 4s.

a. Draw them 2" x 4" for this exercise. Do this even though they are actually 1 3/4" by 3 1/2" wide.

b. Don't try to draw the wood grain. Instead, connect the corners of each 2 x 4 with and "X."



STEP 3.

Draw the gyp board for the inside wall. How thick is the gyp board? Yes . . . one inch or two squares.

STEP 4.

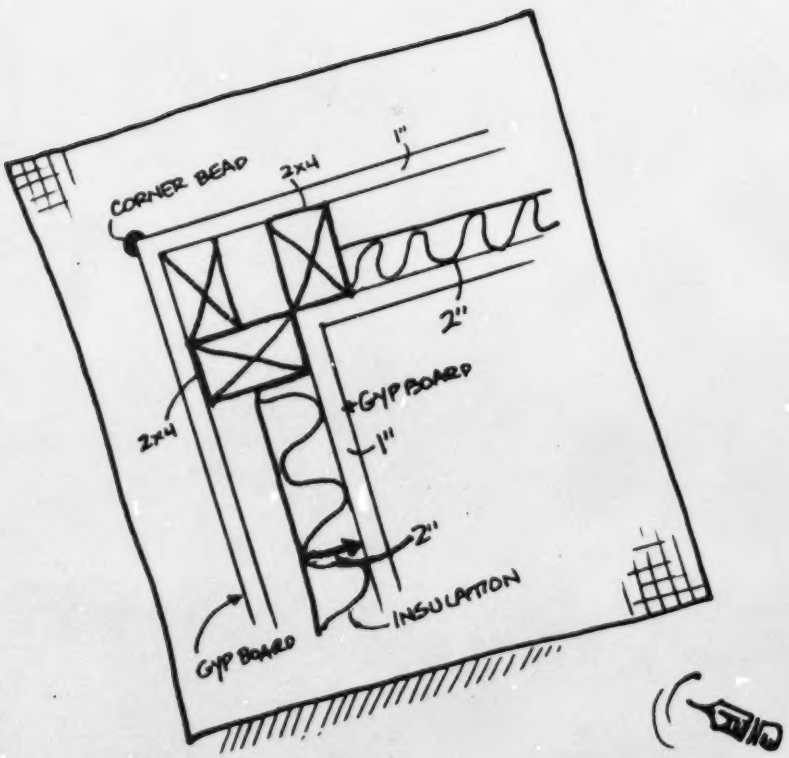
Sketch a curved line to represent the insulation.

STEP 5.

Put in the size of each part. Label the corner bead, gyp board, and insulation. Put the numbers in your drawing just as they are in the rough drawing.

STEP 6.

Make sure that all the details are in your drawing. Then you're done! Give it to your instructor for his or her approval.



Now . . .

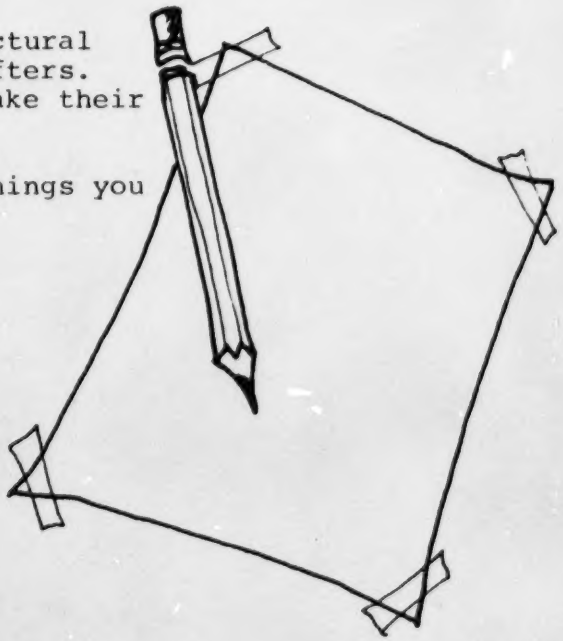
Turn to the Building and Making Reaction Form in your Program Guide. Find the Drafter page. Record your feelings about your interests and abilities in this activity. Return to this page.

Did you enjoy being a drafter? Yes? Then here are

Some other activities:

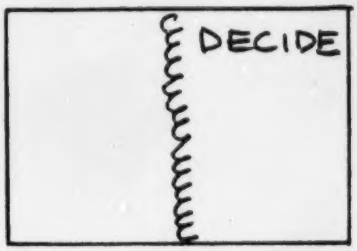
1. Plan to visit an architectural firm. Talk with the drafters. Watch how the drafters make their drawings.

2. Make exact drawings of things you see.



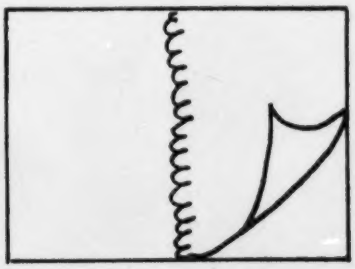
Would you like to find out more about this occupation?

yes ▶ Read DECIDE 12--Drafter.



no ▶ Turn to another Building and Making occupation.

Occupation 9--Carpenter
Occupation 10--Painter
Occupation 11--Roofer



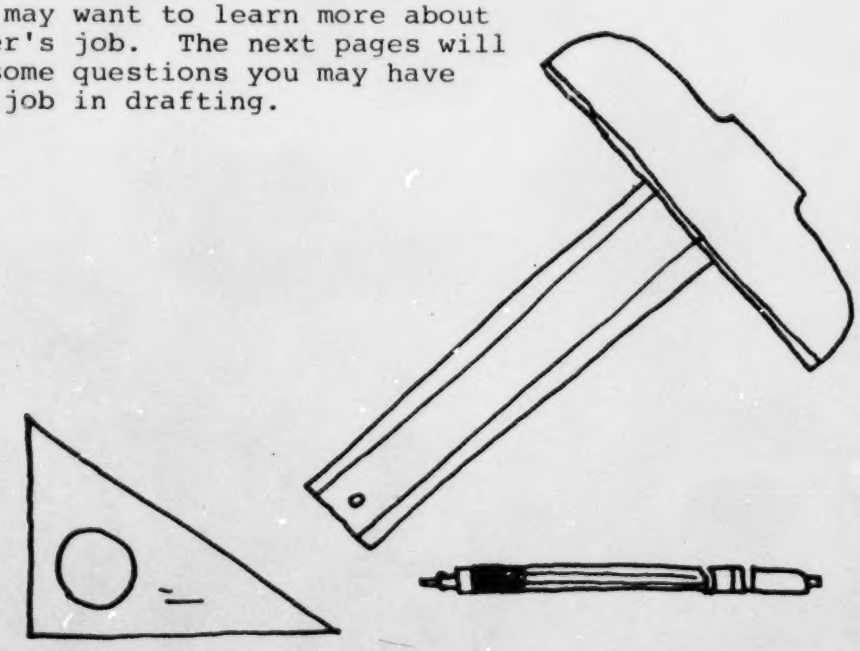
or ▶ Look at the Self-Inventory Chart in your CAP Program Guide. Find another job function to investigate.

Drafter

DECIDE 12

You just finished one of the tasks drafters do. You used some of the skills drafters need in their jobs. You had to work very carefully to make an exact drawing from a rough sketch. You had to use some math. You had to work in an organized way.

Now you may want to learn more about a drafter's job. The next pages will answer some questions you may have about a job in drafting.



Talking with Sue Arrowsmith, a drafter for Reed Architects . . .

People who build things need blueprints (drawings that show how the things should be built). Blueprints show exactly how parts fit together. I am the person who makes the blueprints.

Last year the architects in our business (the people who make plans to build buildings) planned a new office building. They told me their ideas. I made drawings of their ideas. The architects looked at the drawings to be sure I had the right facts. Then I made finished drawings. After these drawings were finished and approved, I made blueprints by putting the finished drawings in a special machine.

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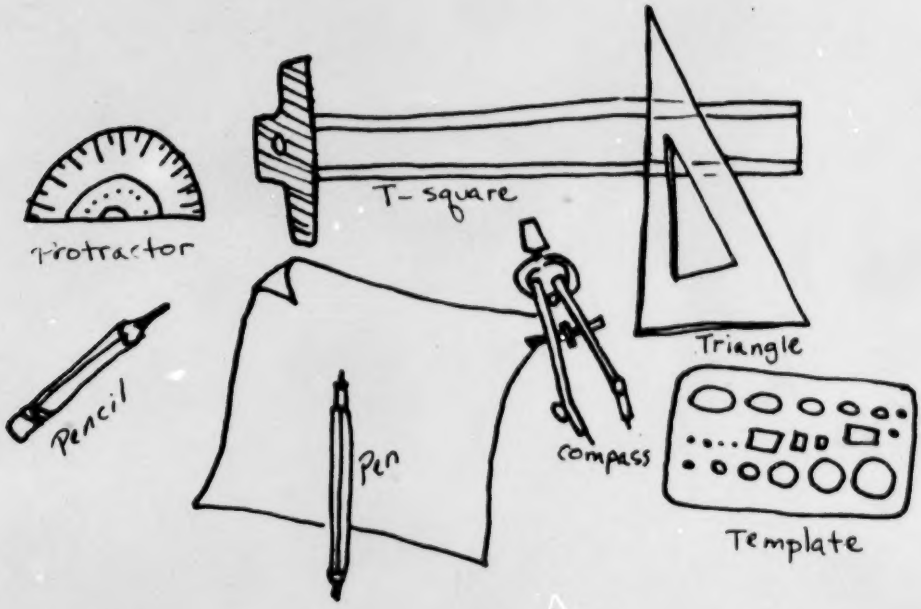
I use many special tools to make my drawings. I use straightedges and T-squares to make straight lines. I use compasses to make circles. I use protractors to make angles. I use templates to make shapes. I use special pens, measuring tools, and other special drawing tools also. My work is very detailed. I must be accurate!



I work with other people, too. Drafters must cooperate with other drafters, architects, and engineers. They must be able to speak clearly and talk intelligently about the work they do. Talking with others is an important part of my job.

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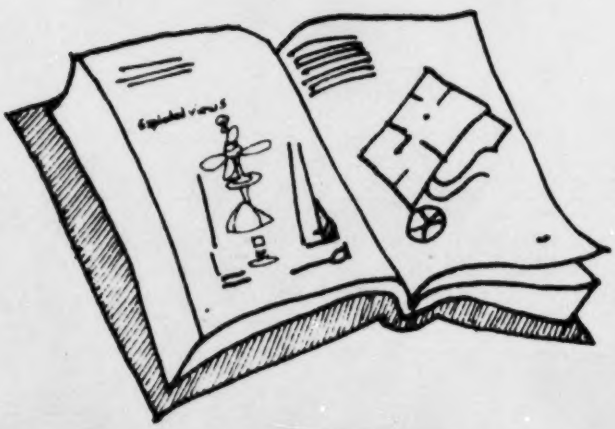
How did you prepare for your job?

There are several ways to learn how to be a drafter. High schools have good courses in drafting. You can learn to be a drafter after high school, too. Technical schools, junior colleges, community colleges, and vocational schools have courses in drafting.

People who get drafting jobs after high school get entry-level (beginning) jobs. Their pay is low. They learn while they work. Then they can be junior drafters.

I took some courses <u>after</u> high school. I studied drafting at our technical school. Because of this, I got a better drafting job. <u>Most</u> drafters begin as junior drafters, get experience, and then become senior drafters.



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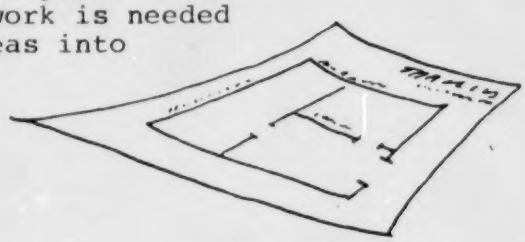
What do you like most about your job?

The best part of my job is looking at my finished blueprints! I work very carefully. I like to see a perfect drawing. I know that my work is needed to make an architect's ideas into somebody's dream house.



What do you like least?

Sometimes I have to work fast to finish a drawing. I worry that I will make a mistake if I try to work too fast! Sometimes I work late to get a drawing done. I don't like to do that when I have other plans to do something with my friends.

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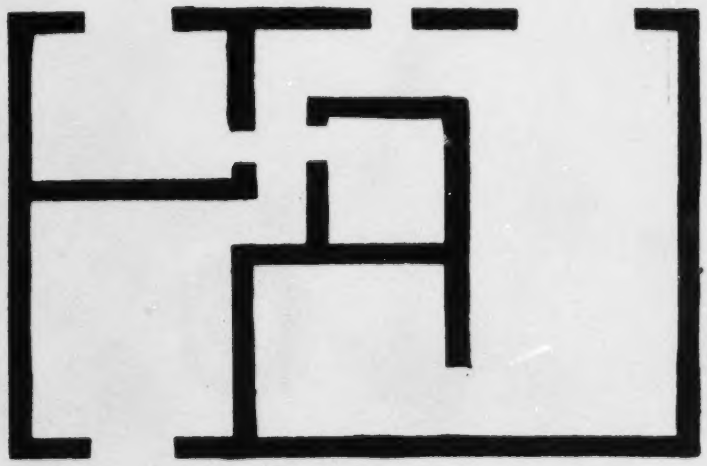
Do all drafters do the same things that you do?

At small companies like this one, each drafter does many things. At big companies, drafters do special jobs. Some drafters make the first drawings of engineers' or architects' ideas. Senior drafters, who have worked for the company for a long time, usually make those drawings.

Other drafters make finished drawings. These drafters are called detailers. Detailers put length measurements on the drawings. They write other information so the finished drawing shows people what the things should look like. Detailers are drafters who have not worked for the company a long time.



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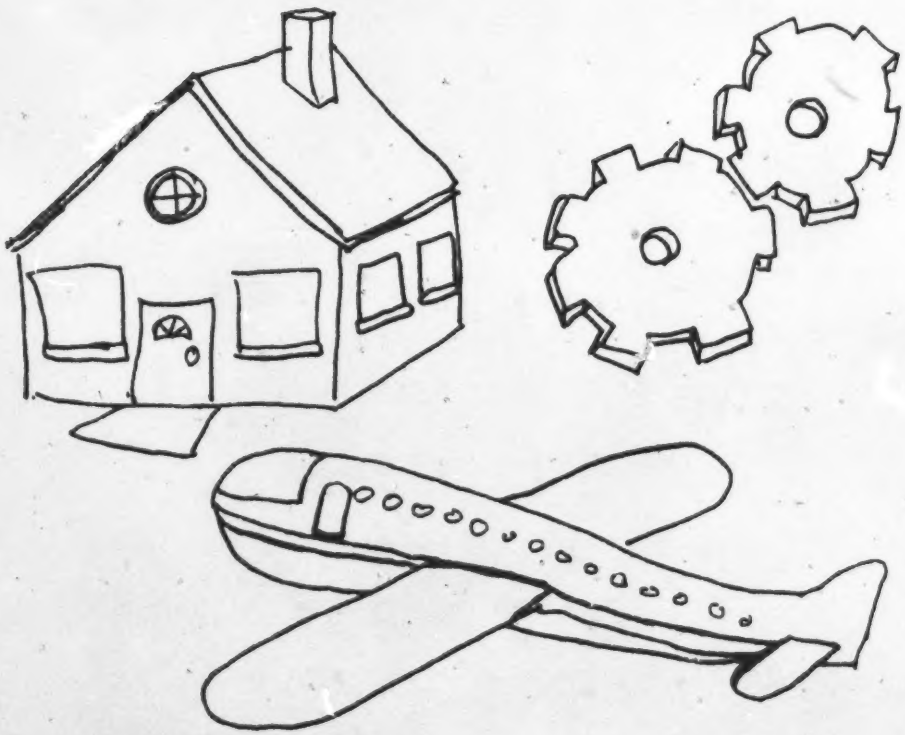
Other drafters look for drawings that are not right. These drafters are called checkers. Checkers are senior drafters.

Drafters who make copies of finished drawings are called tracers. Tracers are usually junior drafters (drafters who do not have much experience).

Some drafters work on only one kind of drawing. Some drafters draw electronic equipment. Some drafters draw machines. Some drafters draw airplanes. Some drafters draw buildings.

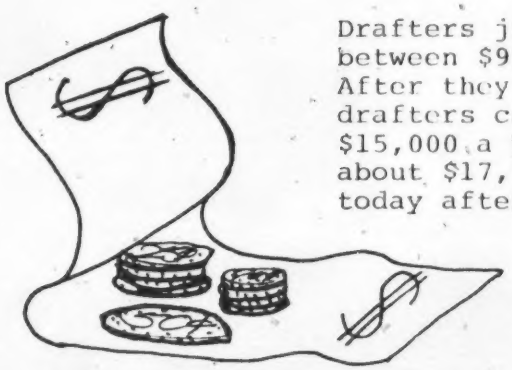


109

What hours do you work?

I work from 8:00 a.m. to 5:00 p.m. each day, Monday through Friday.

How much money do you earn?



Drafters just starting a job earn between $9,000 and $10,000 a year. After they work for a few years, drafters can earn between $11,000 and $15,000 a year. Senior drafters earn about $17,000 a year. I earn $12,500 today after 3 years of experience.

What is the employment outlook?

The employment outlook is good, especially for those with 2 years of technical training after high school Engineering firms and architectural firms are the single largest employers of drafters.

Do you want to learn more about this job?

You can get more education:

- Take the following courses in high school or vocational school.

  Mechanical Drawing or Drafting:

  Drafters need a great deal of drawing experience.

  Mathematics:

  Drafters work with numbers. They must be good in math.

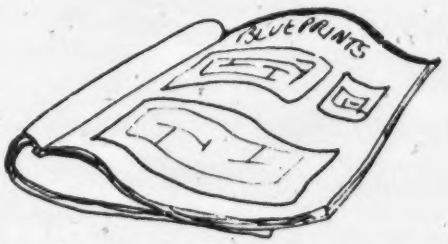
  Science:

  Many drafters work on scientific or technical problems. Knowing about the facts of science can help them.

- Attend a technical school, junior college, community college, or vocational school. Take courses in drafting.

- Learn about some other jobs related to drafter, such as . . .

  -marine drafter
  -wallpaper designer
  -furniture reproducer
  -delineator



You can get some experience:

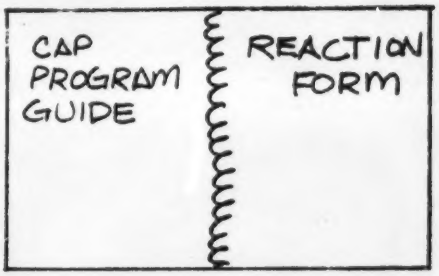
- Get a summer job in an office with many drafters. This experience will help you learn more about a job in drafting.

- Buy a magazine like Popular Mechanics or Popular Science and look for blueprints. Try to read them.

- Apply for a job as a drafter.

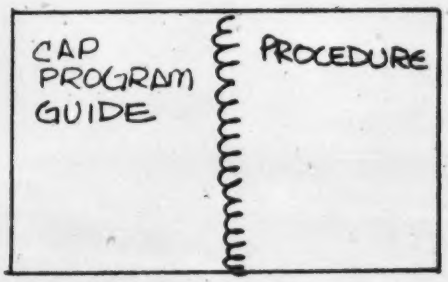
Now . . .

Turn to the Building and Making Reaction Form in your Program Guide. Answer the questions on the back of the Drafter sheet.



What Next?

How many occupations have you investigated so far? Turn to the Procedure section of your Program Guide. Find the directions that apply to you.



Enjoy the Career Alert Planning program!